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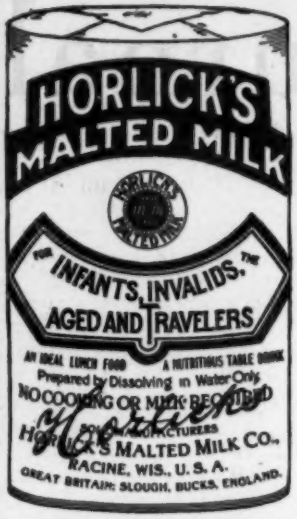
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Original Articles

POST-OPERATIVE VOLVULUS.*

C. A. BUSWELL, M. D., F. A. C. S.,
CHICAGO.

The object of presenting this paper is to bring before the profession this subject that a free discussion may be had with especial reference to its etiology and prophylaxis.

Volvulus is a twisting of the intestine upon its long axis until there is sufficient interference with the blood supply to cause strangulation unless relief is afforded.[1] The exact mechanism of its production is unknown, but the two necessary factors are, first, a congenital or acquired defect in the intestinal attachment allowing of a free mobility, and second, a condition producing an artificial pedicle.

Abnormal length of the mesenteric attachment of a loop of bowel, especially when combined with a lateral contraction of the mesentery, is the most important cause of volvulus.[2] The mesentery may be *elongated congenitally* or it may become stretched as a result of continued constipation and overloading of the affected portion of the bowel and some stretching may result from *adhesions* of some part of the intestinal canal to fixed abdominal structures. A not uncommon cause of elongation is the inclusion of a coil of intestine in a hernial sac. Narrowing or contractions of the mesentery may occur without special elongation as a result of inflammatory conditions. A laxness and relative elongation of the mesentery may be caused by a loss of fat in the abdominal walls and in the mesentery itself. In women, after repeated pregnancy, these conditions frequently occur.

The conditions which predispose to volvulus are more frequently found in persons of advanced years than in the young, and volvulus is therefore most common in the aged to those past middle life. The immediate cause may be a strain or some effort as in lifting or a traumatism, such as in compression of the body. Sometimes overloading of the intestinal tract combined with some effort or strain is of importance. Thus in old people who have suffered from habitual constipation the sigmoid flexure becomes elongated and its mesentery stretched.

In simple volvulus, a loop of intestine twists about its mesenteric attachment. There may be a partial turn or several complete turns. In the former case the obstruction of the bowel is partial or incomplete. In the latter it is almost certainly complete and in addition the blood vessels become so compressed that intense venous engorgement results. Whether the obstruction is partial or complete, but especially in the latter case, distension of the obstructed portion of the bowel rapidly ensues. The bowel becoms dark red or purplish in color and its walls are deeply engorged with blood and swollen by edema. Then extravasations of blood are seen upon the surface and blood stained liquid exudates into the lumen of the bowel as well as into the peritoneal cavity. Finally gangrene takes place. The striæ of the bowel are obliterated by the over extension and rents of the serous coat may occur. Rupture of the bowel, however, rarely takes place. It is more likely to be found above the volvulus than in the affected portion.

Peritonitis sets in rather promptly as a result of bacteria escaped through the injured, congested and edematous walls of the bowel. When bloody extravasation is present in the peritoneal cavity the escaping bacteria may occasion putrefactive changes.

In going over the literature we learn from French[3] that: volvulus constitutes 14 per cent. of all cases of intestinal obstruction. A majority (68 per cent.) of twists are encountered in men and about one-third of them between the ages of 30 and 40. The large intestine is involved in nearly 90 per cent. of the cases, most commonly the sigmoid flexure, next the cecum. The condi-

*Read before the Chicago Medical Society, Jan. 31, 1917.

tion is favored by an unusual length of mesentery, elongation of the intestine by hernia, the traction of adhesions or an accumulation of feces. Rarely one loop of the intestine is twisted about another. The bowel may be twisted on its long axis a half turn, a whole turn or more, complete strangulation being produced. If the intestines below the constriction are distended and deeply congested, a fatal peritonitis is usually developed. Knots are extremely rare. Reichel[4] has shown by direct experiments that simple kinking of the bowel artificially done, is not sufficient to produce obstruction, but there must be infection and localized surrounding peritonitis at the angle.

Craig[5] says: "Volvulus, aside from its peculiar postoperative relationship, is, of course, generally confined to the sigmoid flexure and is fully understood. After the manipulation of the intestinal coils incident to a *celiotomy a volvulus is possible in the small intestines as well,* especially in connection with recent adhesions, as will be shown later."

The chief cause of postoperative obstructions is adhesions and apertures left in the omentum or mesentery.[6] Adhesions may act in various ways. A part of the intestine that normally belongs in the middle or upper abdomen may become adherent in the pelvis, causing a kink or twist. A broad layer of adhesions, from the peristaltic action of the intestines, may become twisted and thickened until a definite band of considerable strength is formed.

From Nothnagel[7]: Causation of postoperative intestinal obstruction by recent (new) adhesions gluing together the adjacent sides of a looped intestine throughout their entire contiguity and thus producing a sharp angulation. On the other hand where two portions of a large loop become attached to each other at a single point no obstruction may be directly resultant, but volvulus becomes extremely easy, especially in the sigmoid.

Gaynet and Laroyenne[8] presented a patient who eight days after the removal of an ovarian cyst, had to be operated on again for symptoms of intestinal occlusion. This operation showed the existence of a volvulus of the cecum which was untwisted; then fixation made to the abdominal wall. The intestinal occlusion disappeared immediately.

Lund[9] in reporting a case of intestinal obstruction found at second operation volvulus which he attributed to coughing and vomiting following anesthesia.

Deaver[10] states that in 276 cases of acute intestinal obstruction there were five cases of volvulus of which three recovered and two died, or 40 per cent. This is a condition not very frequently and generally not definitely diagnosed before operation. The sudden onset and rapid development of symptoms, however, are always sufficient to make clear the fact that some abdominal catastrophe demanding surgical attention has occurred.

Woolsey[11] in reviewing five years of intestinal obstruction at the Presbyterian Hospital, N. Y., found out of fifty cases two were volvulus. The two great etiological factors in postoperative obstruction are either of a septic or a mechanical nature. The etiology of mechanical obstruction is not difficult to understand, though the mechanism is varied. When due to strangulation, the cause is usually a band or a volvulus or both.

I have recently operated on an example of the latter type. When a band, due to operation 13 years before, had so narrowed the mesentery at the base of a loop of ileum as to render volvulus an easy matter. In addition the band itself tightened by the twist of the volvulus, strangulated the mesentery and compressed one end of the loop. Resection of 14 inches was done and recovery was uneventful.

In a strangulation there is usually an obturation at one or both ends of the loop from the band or volvulus, but the important factor is the stasis of the blood supply.

Practically all cases of postoperative obstruction are due to sepsis, operative trauma or adhesions.

Records of Cook County Hospital show several cases of postoperative volvulus and those that have done the best were those where the contents of the bowel were drained.

In regard to our own case of volvulus and the one which has prompted me to present this paper, I have the following to report: Examination made April 14, 1913. The record shows she was married seven years, one child 6 years old, menstruation regular, no pain; troubled with chronic constipation; nervous system hypersensitive. There was an enlargement of the thyroid gland; there was a history of severe attack of inflammation of the right lower quadrant when a child, which had continued to give trouble at intervals since. Physical examination at this date reveals abdominal tympanites most marked over the transverse colon;

McBurney point painful on palpation, and muscular contraction.

Vaginal examination shows a small rectocele; bilateral laceration of the cervix; on bimanual palpation of the uterus, tubes and ovaries painful. Diagnosis: Chronic appendicitis with inflammation about the uterus, tubes and ovaries. From this date to the time of entrance to the German hospital, which was July 12, 1916, she continued to have exacerbations of this disturbance in the region of the appendix. Operation July 13, a right rectus incision was made. We found the appendix to be chronically inflamed, with strong bands of adhesions from the appendix and ileo-cecal valve to the right abdominal peritoneum. On examination of the gall bladder, pylorus and upper abdominal cavity they were found to be normal. Examination of the pelvic organs, both tubes and ovaries were found to be bound down with a mass of adhesions posterior to the uterus.

The operations consisted of removal of appendix, left tube and ovary with a resection of the right ovary. The operation went off smoothly, time about one hour.

On July 17 there were marked symptoms of intestinal obstruction and we called Dr. Nelson Percy in consultation.

July 18 we concluded a second operation was inevitable. This was performed at 11:30 p. m. by Dr. Percy and myself. The abdomen was opened in the region of the old incision and we found the intestinal obstruction due to volvulus of the small intestine. A loop of bowel which was approximately 16 or 20 inches long was untwisted. The intestine was opened above the obstruction and the contents drained, then closed and returned to the abdomen. The patient died at 8 o'clock July 19, 1916.

After consideration of this experience and the above literature we are forced to conclude that volvulus is a mechanical condition and that this loop of bowel is through some mechanical procedure twisted upon its pedicle and that instead of righting itself is held in position by some form of pressure or adhesions. In our own case we find an elongated pedicle but no perceptible adhesion. A blow or contortion through nausea and vomiting or coughing may also be considered an important factor.

We learn also that obstruction follows in about 1 per cent. of all abdominal operations and in reviewing 100 cases of intestinal obstructions, 18 were due to volvulus; also that the death rate of volvulus is appalling, varying with different operations from 40 to 60 per cent. We also find the literature to be very obscure in many cases as to postoperative volvulus and we urge that a most careful examination and record be made by surgeons who come in contact with this disease and that great care should be taken in making abdominal explorations during operations to correct the position of the intestine disturbed.

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POST-OPERATIVE SEQUELÆ AND THEIR AVOIDANCE.*

GEORGE DE TARNOWSKY, M. D., F. A. C. S.
CHICAGO.

As it is manifestly impossible to cover all surgical sequela within the short space of time allotted me in this symposium, my remarks will be confined to the abdomen, and I shall merely seek to emphasize a few practical points. Our service at the Cook County Hospital gives us a rare opportunity for studying the unfortunate results of surgery. Many patients, having spent their money elsewhere, and finding themselves troubled with postoperative complications, are forced to accept free service in their search for relief. This statement does not in the least imply that we do not have—on occasion—to repair sequela on our own patients; the fact remains that the Cook County Hospital is, in a measure, the clearing house of the county.

I would desire, first of all, to call to your at-

*Read before the Chicago Medical Society, Jan. 31, 1916.

tention the question of atrophy of abdominal wall muscles due to interruption of nerve supply, a subject which does not receive the attention, in medical literature, which its paramount importance calls for.

In inguinal herniotomies, after splitting the external oblique muscle and exposing the canal, a small nerve is to be seen passing one c. m. above and almost parallel to the lower margin of the conjoined tendon. This is the most important trophic nerve of the conjoined tendon. Its removal or inclusion in the coapting sutures is probably responsible for many hernial recurrences. I have repeatedly operated upon such recurrences at the Cook County Hospital and found an almost complete atrophy of the conjoined tendon, together with absence of the aforementioned branch of the ileo-inguinal nerve. It should always be sought for and its injury carefully avoided. While on this particular region, let me also call your attention to the mass of pre-peritoneal fat which is found in almost seventy-five per cent. of all inguinal herniæ. This mass as pointed out by my colleague, Dr. Speed, varies in size from a small oblong mass having the diameter of a lead pencil to one of the size of a man's thumb, and is always located antero-internally to the hernial sac proper. If left in situ, it is bound to act as a wedge and undoubtedly also predisposes to recurrences. Its careful removal should, therefore, be imperative.

In laparotomies, especially those involving the upper abdomen, we not infrequently get an atrophy of the rectus muscle with the slow or rapid formation of a ventral hernia. The nearer our incision approaches the outer edge of the rectus, the greater will be the destruction of the abdominal intercostal nerves which supply it. In lower abdominal trans-rectal incisions there is also the added danger of injury to the deep epigastric artery, causing a combined defect of blood and nerve supply. In surgery of the lower abdomen, where muscle separation is not advisable, the para-median incision should always be employed. While the old transverse rectus incision of Mickulicz has largely been abandoned in gall-bladder surgery, on account of the marked retraction of muscle fibres which it caused, the method of Willy Meyer in avoiding this is placed on a sound theoretic and practical foundation. Meyer anchors the rectus muscle to its anterior sheath above and below the proposed line of incision, thereby preventing retraction of its fibers. The transverse incision of the peritoneum, as practiced by L. L. McArthur, for exploration, drainage or removal of the gall-bladder has been of great help to me. Coaptation of the peritoneum thus becomes simplicity itself. In closing any laparotomy wound, additional retention sutures should always be placed, including the anterior rectus sheath and skin, and should not be removed until normal peristalsis is restored. Some of us are still using too much tension in our sutures. An easy coaptation of tissues, and not pressure necrosis, gives us the firmest repair of abdominal wall structures. In operations upon the kidney the same consideration should be given to nerve supply.

As indications for drainage lessen, inter-muscular incisions will become more and more habitual. Either the para-median or the transverse rectus incisions should be employed in all upper abdominal operations.

The question of postoperative fecal fistulæ is a very important one. While a percentage, though very small, of operations for appendiceal abscesses, for tubercular peritonitis, for salpingitis, for ovarian cysts, or for certain types of carcinoma of the bowel can reasonably be expected to develop a fecal fistula, it is my conviction that many of these cases we encounter are directly traceable to faulty judgment or defective technique, either during the operative or postoperative period. Our present tendency is towards using fewer laparotomy sponges throughout the course of the operation, a minimum handling of the tissues, and dispensing with tubal or other forms of drainage. When we shall all be agreed regarding the defensive and not destructive meaning of peritonitis, and when our technique shall be entirely devoted towards increasing the defensive properties of the peritoneum, our mortality and postoperative sequelæ will be reduced to their normal minimum. That abuse of drainage, and more particularly, that the repeated reintroduction of drainage tubes or of cigarette drains into the peritoneal cavity, account for a large percentage of postoperative fistulæ, is my firm conviction. Within the past six months I have had the unpleasant task of repairing four such fistulæ and of these, three communicated—either singly or by several sinuses—with the ileum, not the cecum. In all four cases drainage tubes had been repeatedly in-

troduced, removed and reintroduced. One patient, a boy sixteen years old, had had his fistula since December, 1913! In this case I repaired three perforations of the ileum and did a lateral ileocolostomy with most gratifying results. A second case, that of a young man twenty-two years of age, had been patient for nine months, following a laparotomy for appendiceal abscess. I closed two perforations of the ileum and incidentally removed an apparently intact appendix. I carefully say, apparently, because the specimen was lost before it could be subjected to a microscopic examination. Multiple intestinal fistulæ, produced by the cutting action of through and through silkworm-gut sutures, constitutes an anomaly which occurred on my service at the Cook County Hospital. A male patient was brought in nine days, after having been kicked in the abdomen, with well marked symptoms of ileus. He collapsed as soon as the peritoneum was opened. He was hurriedly given a quart of normal saline by phleboclysis, two cigarette drains were left in the peritoneal cavity and the incision closed with through sutures. Twenty-four hours later, following a violent fit of coughing, a half inch diastasis of the incision occurred, thus exposing the silk-gut sutures. Fourteen fistulæ of the small bowel were formed by the peristaltic friction of the bowel on the sutures, these were all repaired, but the patient succumbed a week later to general sepsis.

For the prevention of postoperative shock, a rapid, safe technique, which should include a minimum handling of tissues, as well as delicacy of handling, plus the prevention of acidosis, should be our aim. Long before the subject of acidosis was placed on a scientific foundation, clinicians were empirically using large doses of potassium and sodium bicarbonate before and after operations. I knew personally that my colleague, Dr. A. B. Keyes, was using antacids twenty-five years ago. Whether or not we can follow Crile in his theory of anoci-association, we owe him a deep debt of gratitude for having popularized the prevention and cure of surgical acidosis. There is no question but that patients who have received half drachm doses of sodium bicarbonate, three times daily, for two days prior to, and four or five days following laparotomies, convalesce more rapidly and manifest less shock than do those deprived of this simple but efficacious method.

When we consider that operations for the relief of postoperative intestinal obstruction give us a mortality of almost fifty per cent., prevention of this formidable complication should enlist our most careful attention. Without unduly going into minute details of technique, it is axiomatic that a minimum of trauma, covering of all raw surfaces, avoidance of drainage and complete closure of the abdomen, followed by primary union, will minimize such a surgical calamity. If the obstruction is incomplete, procrastination is permissible as many adhesions stretch or disappear; when complete, the sooner we re-enter the peritonum and repair the condition, the lower will be our mortality. Even a paralytic ileus is not necessarily a fatal complication. Reopening of the abdomen, with puncture of a loop of distended bowel and drainage of bowel contents, relieves the patient of tympanites and septic material at the same time. The puncture may be closed or a temporary enterostomy may be made. I do not think it wise to perform either an entero-enterostomy or a resection in the presence of a paralytic ileus. Pituitrin in ileus is enthusiastically recommended by C. L. Gibson of New York. I have no personal experience with this drug, but, on theoretic grounds, the danger of its causing intestinal rupture must not be lost sight of.

There are many other interesting sequelæ which could be discussed in a longer paper; perhaps the colleagues who are to lead in the discussion will bring a few of them out.

LOCAL ANESTHESIA.*

FREDERICK G. DYAS, M. D.,
CHICAGO.

The development of the various forms of anesthesia has not kept pace with the advancement of surgical technique.

Generally speaking, there is about as much hazard to the patient from the administration of a general anesthetic as there is from the performance of a major operation itself in competent hands.

This statement applies both to the immediate and remote effects of the anesthetic.

*Read before the Chicago Medical Society, March 21, 1917.

Medical men have been so engrossed with matters of surgical technique that only too often the question of the anesthetic has been given scant consideration. The unfortunate patient usually fell into the hands of the youngest member of the hospital interne staff, who was vastly more interested in the progress of the operation than in the administration of the anesthetic. This, of course, resulted in many tragedies until the method now in vogue in most of our large hospitals was put into operation, viz., the employment of salaried, skilled anesthetists to take the place of the green interne. This movement resulted in a great improvement in the postoperative complications and gave the surgeon a sense of security during the course of the operation, which was in marked contrast to the constant anxiety as to the anesthetic under which he labored in former times.

However, general anesthesia can probably never be robbed of a certain amount of hazard no matter what agent be used or how skilled the anesthetist, therefore, it is the duty of the medical profession to adopt local for general anesthesia whenever possible. Young children and very nervous individuals will probably always require general anesthesia for operative work, but the number of operations which can be satisfactorily performed under local anesthesia upon normal individuals is rapidly growing, and it is a striking fact that physicians and nurses who have had opportunity to observe the practical effects of local anesthesia nearly always choose that method for operations upon themselves.

The method of local antedates that of general anesthesia as it was practiced by the ancient Arabian physicians in the form of nerve compression. Large nerve trunks were subjected to pressure until anesthesia was produced in the area supplied by that nerve.

Cold, applied directly to the affected part in the form of ice, and later freezing sprays, is a method known even to the laity. Many of these sprays have been extensively used and have filled a very important part amongst local anesthetics.

Chemical agents, such as poppy, Indian hemp, mandrake root, opium, ether and chloroform, were extensively used locally until the discovery of the hypodermic method of medication by Wood in 1853. This opened up a wide field for the local administration of drugs believed to have anesthetic properties and was closely followed by the discovery of the anesthetic properties of cocain, by Scherzer, in 1860. Cocain was first used for surgical purposes by Reclus, who later abandoned it because of its toxicity.

Schleich popularized the use of cocain by using it in combination with morphin in dilute solution as cocain hydrochlorid. However, cocain has had a bad history and the profession was afraid to use it extensively for major surgical work. As a result of this fear, an attempt was made to find a less toxic agent. Various drugs have been used, many of them extensively, but it remained for novocain to fill the long-felt want. This substance is said to be about only one-seventh as toxic as cocain, and yet possesses to a remarkable degree its property of inducing analgesia. However, this fact is of the greatest importance, viz., that novocain used in sufficient dosage to produce satisfactory local anesthesia, is practically without toxic effect. In the summer of 1916 another substance was introduced experimentally to take the place of novocain, which was almost impossible to procure. The name of this agent is apothesine and it was distributed to a number of men working with local anesthesia by Parke, Davis & Co. About 85 major operations were done with the apothesin supplied to me, which is used in the same strength and dosage as novocain. Its toxicity is probably about the same as novocain, and it has the same resistance to boiling. As a local anesthetic, it appeared in no way to be inferior to novocain. Unfortunately, apothesin is not obtainable at the present time, but the hope is held out that it will be put upon the market before long.

"The degree of toxicity of most drugs depends upon the rapidity of their absorption. 0.3 to 0.4 gm. of novocain in aqueous solution may be dangerous when rapidly absorbed, while 0.5 to 1.0 gm. may be safely used where absorption is slow. Prolonged boiling destroys the action of novocain, but boiling two or three minutes does not harm. The anesthetic effect of novocain may be prolonged by using solutions of magnesium sulphate and calcium chlorid in strengths of one-fourth to one-half of one per cent." M. L. Harris.

Potassium sulphate likewise increases the duration of analgesia when combined with novocain.

Hertzler says the duration of novocain anesthesia without an adjuvant is about fifteen min-

utes, but its action is more prolonged when adrenalin is used.

Balfour[3] states that the healing of wounds has not been retarded by the use of novocain in the cases observed in the Mayo clinic.

Braun[4] whose book on local anesthesia is classic, proved by experiments upon himself and others, that the addition of one-half per cent. potassium sulphate to the novocain solution, markedly prolonged the anesthesia.

Harris has recently used chloretone for the purpose of increasing the duration of the local anesthetic. Chloretone is added to the novocain preparation in sufficient amount to form a saturated solution. It is necessary to bear in mind that chloretone volatilizes at a temperature of 160° F. and, therefore, after boiling the novocain solution time must be allowed for the temperature to subside to 160°F. or lower, before adding the chloretone.

Bier's method of local anesthesia consists of the intravenous injection of novocain between two ligatures or bandages tightened about a part. This method has no advantages over the method of infiltration or nerve blocking, but carries with it the added danger of rapid absorption from the venous circulation when the constriction is removed.

For a long time local anesthesia was almost wholly confined to operations upon the eye, nose and throat. In major surgery, the local method for a long time fell into disrepute because of the toxicity of cocain. Braun makes the statement that were it not for the introduction of the less toxic novocain and adrenalin which made possible the development of the technique of infiltration anesthesia and nerve-block, the method of local anesthesia would in time have been abandoned.

Braun[5] states further that the chief points of the new technique of local anesthesia are the infiltration of the field of operation, the blocking of the sensory nerve paths, and where it is possible a combination of the two methods with a direct infiltration of the line of incision. Esmarch's constriction of an extremity is not necessary to procure good anesthesia where adrenalin is employed. Many operators employ twilight sleep to procure a tranquil state of mind for their patients, and I can recommend this strongly to those who have not used it, as an auxiliary to the local anesthetic. Too little attention has been paid to the psychic condition of patients, whether they were to receive a general narcosis or a local anesthetic. While Crile justly receives the credit for calling attention to the enormous importance of anesthetising the patient under the proper environment and in such a manner as to quiet his fears, many others appreciated the necessity of preserving absolute quiet in the anesthetising room. Loud noises and the clatter of instruments may often unnerve a patient and always increase the amount of anesthetic and the length of time necessary to procure narcosis. The same principle holds true in local anesthesia.[1]

Kroenig and Sigel[6] state the following: "We avoid disturbing the patients by light or sound. Patients in twilight sleep are particularly susceptible to stimuli of light. To avoid this, patient's ears are plugged with cotton and the eyes bandaged. With these precautions, we produce in the majority of cases a complete amnesia of the operation and preliminary preparations. Thus we accomplish the first of Crile's requirements, i. e., the elimination of psychic trauma."

Bloodgood[7] says "during a successful operation with local anesthesia the blood pressure remains normal. Sudden rises indicate painful manipulations. When these are continued they are followed by a fall in the blood pressure. This means shock." During the past eighteen months I have done certain operations only under local anesthesia, but with each succeeding month I have extended the use of the infiltration and nerve blocking method, until now fully one-half of my operative work is done without the aid of a general narcosis.

No man who has given the matter consideration can help feeling that under the usual methods of anesthetising patients, the hazard to them from the use of a general anesthetic, even in skilled hands, is too great, not to mention the danger of postoperative complications.

Ether, chloroform, nitrous oxide and oxygen, or ethyl chlorid may cause death per se in dosage sufficient to produce good narcosis. Novocain and certain other agents used to produce local anesthesia are practically without danger to the patients in amounts necessary to produce complete analgesia of the operative field.

Ether and chloroform cause postoperative nausea and vomiting, acute dilatation of the

stomach and increase the gas pains following laparotomy. More remotely ether not infrequently causes postoperative pneumonia, and chloroform may produce degeneration of the liver parenchyma.

Recently I performed a herniotomy under ether anesthesia, because on that particular morning I was unable to procure any novocain. The patient began to cough up a rusty sputum on the third day, and in the following twenty-four hours presented the classic picture of a lobar pneumonia. I believe this pulmonary complication was directly chargeable to the use of ether, and while the man recovered, his convalescence was considerably prolonged, and he had had unwillingly conferred upon him an increased susceptibility to pneumonia.

In two cases recently operated on for inguinal hernia, under infiltration and nerve block, the patients were given full meals of meat and potatoes, unknown to those in attendance, three hours after the operation, which they ate with relish and without bad effect. One of these men felt so well that he persuaded another patient to smuggle him his clothes, with which he walked the length of a long ward and indulged in a cigarette within four hours of the conclusion of his operation. It goes without saying that few ether patients enjoy such a sense of well-being on the day of the operation.

The use of local analgesia compels greater gentleness in the manipulation of tissue. This lessens local trauma and post-operative pain.

In out-patient dispensaries patients may be immediately discharged following minor operations, which from an economic standpoint is of the greatest importance both to the individual and to the hospital.

Under conditions when an anesthetist is not available, the operator who uses local anesthesia is able to proceed unaided.

The arguments most frequently heard against the use of the local method are that it is time-consuming and produces imperfect analgesia. The first objection may be answered by the fact that frequently the production of a general ether narcosis takes longer than does the interruption of pain conduction by nerve block or infiltration. This is especially true of hemorroidectomy, as evidenced by the fact that many patients wake up during ether anesthesia when the sphincter ani is dilated, and require considerable more ether to continue the narcosis.

The objection of imperfect analgesia may fairly be said to depend upon the skill of the medical attendant, as the ability to produce satisfactory anesthesia increases with training and experience.

The use of various agents for the production of local anesthesia by the methods of infiltration and nerve block, is becoming daily more a matter of routine. Braun gives in detail the statistics of three large German hospitals covering the last ten years of cases done under general and local anesthesia, showing an increase during that time from less than one per cent. to over fifty per cent. of cases done under local anesthesia.

This is a striking proof of the growth of this method, and I feel confident that a study of the postoperative morbidity and mortality reports would show greatly in favor of the local method.

PERMANENT NERVE BLOCK FOR CHRONIC INTRACTABLE PAIN

Great as are the advantages of local anesthesia, I believe that its greatest field of usefulness has just been opened up. I refer to the permanent nerve-block for the relief of chronic pain.

This method of treatment must be reserved for those patients who have gone beyond the hope of other relief; as in recurrence of malignant tumors after operation. If it were possible, by the injection of those nerve-trunks which supply the painful area, to produce a localized analgesia, the necessity for the use of morphin would be obviated, and the unfortunate patient might be conducted to a peaceful end.

It is well known that morphin and other drugs of its kind do not entirely control the severest pain. I recently lost a case of recurrent carcinoma of the breast with enormous swelling of the arm upon the affected side, in which the pain toward the last could not be controlled entirely by hypodermic injections of one and one-half grains of morphin every two hours. It is in such a case that the proposed method of alcohol injection of the brachial plexus by the method of Kuhlenkampf, would render the entire upper extremity anesthetic. Of course at the same time there would be a motor paralysis, because the nerve trunks are made up of both motor and sensory fibers. However, the loss of motor power under such conditions would be negligible.

The same method can be used in carcinoma of the pelvic organs by blocking the sacral plexus. For hopeless conditions of the upper abdomen the paravertebral injection of the intercostal nerves might be employed. This method was suggested to me by the well known use of solutions of alcohol in from 40 to 60 per cent. strength, for injection of the trigeminus nerve in cases of tic douloureux.

Those who have used this method most extensively say that perfect analgesia is produced whenever the alcoholic solution reaches the nerve trunk. This analgesia persists from six to eighteen months. If this same analgesia can be produced in those nerve paths which conduct the painful sensation from the diseased area, we shall be able to produce as complete a loss of pain for as long a time as in the case of trigeminus neuralgia.

I, therefore, predict for this method of local anesthesia its greatest field of usefulness, and believe that the method of local anesthesia will continue to find more adherents for its use, both for the production of temporary and lasting local analgesia.

CONCLUSIONS.

1. The patient's life is not endangered by dosage sufficient to induce local anesthesia.
2. The general comfort of the patient after operation is much improved because of lessened trauma and decreased gas pains.
3. Convalescence is not complicated by the anesthetic and thereby shortened.
4. Ambulatory patients may be immediately discharged after operation.
5. An anesthetist is unnecessary, but a "Moral anesthetist" is desirable.
6. The use of adrenalin renders the field less bloody, prolongs anesthesia, delays absorption, and thereby lessens toxicity.
7. Nerve-block as a lasting anesthesia for chronic pain should find as wide an application as its use for operative procedure.

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ORTHOPEDIC TREATMENT OF POLIOMYELITIS ANTERIOR.

EDWIN W. RYERSON, M. D.,

Professor of Orthopedic Surgery, Chicago Policlinic; Assistant Professor of Surgery, Rush Medical College; Orthopedic Surgeon, Children's Memorial Hospital, and Home for Destitute Crippled Children.

CHICAGO.

It is well within the bounds of truth to say that practically every case of infantile paralysis can be improved by proper treatment. The medical side of the management will not be discussed in this paper further than to say that it seems reasonable to give hexamethylenamine as a prophylactic and in suspected cases, and that injections of serum from recovered cases may prove to be beneficial. Meltzer's proposal to inject adrenalin into the spinal canal during the acute attack is also attractive.

The orthopedic treatment of these patients is of great importance, and every general practitioner should familiarize himself with its principles. The course of the disease is arbitrarily divided into three stages. First, the acute stage, beginning with the onset and lasting until all pain has ceased. Second, the stage of convalescence, lasting approximately two years in cases which are properly treated, and third, the chronic stage, when no further improvement in actual nerve conduction can be expected.

In the acute stage, after the paralysis has become well established, rest and prevention of deformity are the most important considerations. Massage, electricity, active and passive motions should not be used as long as any pain is present. The patient should be kept recumbent in bed, and if the pain is very severe a Bradford gas-pipe frame or a plaster of Paris cast may be applied to secure immobilization. Any tendency to foot-drop, flexion of the knees or other position-deformity must be prevented by light apparatus, such as tin, wooden or plaster of Paris splints, since even in the earliest weeks a severe contracture of muscles, particularly of the tendo Achillis, may occur. The legs should be kept parallel and not allowed to become spread apart, as the tensor fasciæ latæ (tensor vaginæ femoris) is apt to become structurally shortened.

The acute or painful stage usually lasts only a few days, although it may be prolonged for weeks or even months. Care must be taken to keep the affected parts warm at all times. The patient's

general health and hygiene should be looked after, but all unnecessary medication should be avoided.

When the pain has entirely disappeared, the second, or convalescent, stage is reached. It is now important to make a careful examination of the extent and distribution of the paralysis. A written record should be made of all of the affected muscles, with an estimate of their relative loss of power. This can be fairly well done, after a little practice, by simply asking the patient to resist while the physician attempts to move the various joints. The spring-balance method of testing muscular power, recently devised by R. W. Lovett, is much more satisfactory, but more complicated. Electrical tests are often misleading and always useless.

During the convalescent stage it is extremely important to avoid tiring the affected muscles. It must be remembered that many of the muscles are not entirely paralyzed, but merely weakened, and they will not regain their normal strength if they are overworked. Light massage is undoubtedly helpful. Electricity is of no demonstrable value. Careful muscle-training is the keynote of therapy in this stage, but it must not be pushed to the point of muscle-exhaustion. Orthopedic apparatus is often necessary to prevent deformity and also to prevent the over-straining of weakened muscles. Some of the most useful braces are of the simplest type, and can be made by any moderately intelligent blacksmith. They should always be as light as possible, and for this reason celluloid splints, molded over plaster of Paris models, should be used when circumstances permit. They are, unfortunately, rather expensive.

Efforts should be made in the severer cases to prevent the patients from becoming bed-ridden. Corsets or back braces may be necessary, in addition to leg braces. No operative treatment should be considered during the convalescent stage; that is, until at least two years have elapsed since the onset of the disease.

The only exception to this rule is in the case of severe deformity which has not yielded to conservative treatment. Here it is permissible to perform tenotomies or tendon and muscle lengthenings so that proper apparatus may be applied.

To summarize the treatment in the second stage, it is advised to keep the affected parts warm, to encourage the careful exercise of the weakened muscles, to avoid their overuse, and to prevent deformity.

The third, or chronic stage, is reached when no further muscle-strength can be developed. A careful survey of the patient's condition must now be made, and the defects noted in the order of their importance. The subject of treatment now becomes of economic importance. The patient must be made able, if possible, to walk without crutches or braces, and to maintain an approximately normal shape. Probably the hardest problem is the prevention and cure of scoliosis, or lateral curvature of the spine, in those unfortunates who have paralysis of the abdominal or spinal muscles. Forcible correction by plaster casts is useful in some cases, and a few patients have had bone splints placed in the spine to maintain the correction. Corsets or braces will be of much more general use in this class of cases, however, as a rule.

Paralysis of the legs, of greater or lesser severity, is found in the vast majority of infantile paralysis cases, and it is here that the chief surgical interest is centered. Operations may be required, first, for the prevention of deformity; second, for the relief of deformity; third, to redistribute properly the remaining muscular strength, and fourth, for the production of stability.

Deformities must always be corrected, if possible. Osteotomies, tenotomies and myotomies are often necessary. In the milder cases the transplantation of tendons or muscles may produce brilliant results. It requires experience and judgment to select the proper cases for this procedure, and without great care the results may be disappointing. Some of the most satisfactory transplantations are those of the peroneus longus or the toe extensors to the paralyzed tibialis anticus, or two of the hamstrings to the paralyzed quadriceps extensor femoris. Many others are of value but cannot be detailed in a paper of this character. Operations to produce stability are sometimes very useful, such as stiffening the hip or the ankle joint. It is not wise to stiffen the knee joint, as this joint can be well controlled by a brace. In cases of very weak or flail ankle joint, the operation of astragalectomy, as perfected by Whitman, gives excellent results.

It is hardly to be expected that work of this highly specialized character will be of much interest in this general meeting of the medical

society, and no apology is needed for omitting further details, however fascinating the subject may be to the orthopedic surgeon.

DISCUSSION.

Charles A. Parker: From the orthopedic standpoint the optimistic feature is the fact that practically every case that survives the acute attack may eventually be gotten upon the feet and by means of operations and appliances enabled to walk. Crutches are at times necessary, but by proper treatment practically every case can be made more or less independent and saved from an enforced wheel-chair existence.

In many cases with limited paralyses little difficulty is encountered in obtaining these results and many walk in some manner without a physician's care.

As a fundamental principle in treatment, all deformities should be prevented or corrected as a preliminary to the employment of stabilizing measures, either operative or mechanical. The positions to be secured are an extended hip and knee and the foot at right angles to the leg both in the anteroposterior and the transverse relation. These corrections are usually readily accomplished by fairly simple means as tenotomies, myotomies and fasciotomies and the hip and knee easily maintained in their corrected positions. The maintenance of the foot in its proper position is much the more difficult problem. However, by the numerous means now at our disposal it can generally be very satisfactorily accomplished.

The severe deformities of the spine, paralytic scolioses, of themselves, rarely interfere with locomotion. They are very efficiently overcome by the use of a removable corset of plaster, leather or celluloid made over a corrected plaster of Paris torso.

THE MEDICAL ASPECT OF ACUTE POLIOMYELITIS.*

FRANK D. FRANCIS, M. D.,
CHICAGO.

The view must be very broad of a virus that may invade the human body and seriously damage it, especially its cerobrospinal system. The entire nervous system or any part of it, in any combination, more frequently the anterior horns, may default more or less, as the result of the infection which also may produce general symptoms and lesions in the glands, intestines, spleen, liver, lungs and kidney. The disease is regarded as communicable and infectious. It exists sporadically, epidemically and endemically.

In 1840, J. von Heine gave a recognized clinical description. In all probability the disease has existed for hundreds of years. As early as 1784, paralysis, which occurred in teething children and those with bowel troubles, was described. The pathology was established by von Reinecker and von Recklinghousen in 1863. The first epidemic in the United States occurred in 1841 in Louisiana. Previous to 1905 but 890 cases of the disease had been noted. Since then epidemics have taken place with increased frequency both here and in Europe. Boston and New York have been the chief centers in the United States, but the states of Minnesota, Wisconsin, Illinois, Vermont, Massachuetts, Washington, Iowa and Pennsylvania have had epidemics, and nearly every state some cases. In 1907 New York had 2,500 cases. In 1916 New York had over 9,000 cases. It is now spreading in Ontario, Canada. In 1911 Illinois probably had as many or more cases than this year, from the death rate. So far this year Illinois reports over 760 cases. Over 250 cases occurred in Chicago. Thirty-six per cent. of Illinois cases outside of Chicago developed on farms. Sweden, Denmark and Germany have had epidemics, and in 1905 Wickham considered the character epidemic.

In 1909 Landsteiner and Popper transmitted the disease to monkeys by intraperitoneal inoculation with poliomyelitic cord. Later, Flexner and Lewis, using intracranial inoculation, had no trouble in reproducing and transmitting it through a series of monkeys.

The generally accepted facts are that the poliomyelitis virus is found in brain, cord, tonsil, nasopharynx, spinal fluid, stomach and intestines.

Flexner and Noguchi cultivated the virus and found very small bodies, single or double or in chains. The virus is filterable, resists glycerinization and is very resistent. Flexner regards the nasopharynx as the atrium. The nasal, bronchial and intestinal secretions may spread it. Carriers, human, horse and stable flies, mosquitoes, bugs, pets, etc., may possibly be disseminators. The human carrier seemingly is dangerous. The virus may remain months in the nose, as in monkeys it has remained six months.

Other workers have reported other findings. Dr. Mathers of Memorial Institute recently reported finding a micrococcus in six cases out of seven in brain emulsion. Dr. Rosenau has also noted a coccus. I believe also Drs. Herzog and

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Nuzum at the county hospital have found a coccus in several instances.

In a series of 90 cases observed by me, the average age was four years, the youngest six weeks, and the oldest fifty years. The girls numbered forty and the boys fifty. August was the favorite month, 50 per cent. of the cases coming in the last two weeks of August. Over 10 per cent. of these cases were Jewish. Four of these cases were nursing babies. Two were on mixed feeding. Two were colored. In one instance only were there two members in a family, the second case following the first about 8 days.

In New York, out of a series of 7,000 cases, in 6,521 instances, there was 1 case, two cases in 205 instances, three cases each in twenty families, four cases in one, and five cases in another family. Fifty-five of the ninety cases in this series were three years or under. Four out of the ninety were over ten years. In this group most of the children were well nourished, clean, blonds, and well kept.

Several of the number had been bathing in the lake, but the great per cent. were too small for that diversion. The north temperate zone seems to be the choice of the infection as far as known. Mothers are very prone to assign catching cold, and falls or injuries and teething.

One attack establishes immunity, as a rule, and for many years. Second attacks have been reported. Sometimes it is associated with, or follows other acute infections. Personally, I lean very strongly to the idea that the virus may get in through the intestinal tract. In this group of ninety, the gastrointestinal factors have been prominent. In the Massachusetts group the intestinal features were prominent, while in New York the cases with sore throat, bronchitis and colds were frequent. Like the blind men feeling the elephant, each observer's attitude is affected by the class of cases he happens to be watching. The high degree of communicability in many places is hard to explain. So far, none of our doctors, nurses or attendants have become infected, nor is such a happening frequent from reports. Up to a few years ago poliomyelitis was admitted to general wards, with very few or any cross infections, on the part of the poliomyelitis. Sometimes a case occurs miles away from any other, out on some farm. Again, epidemics may take place in midwinter. Lice and bugs seem not to get the virus on sucking the victim's blood. In this group of ninety cases I haven't seen over three nasal discharges. Cervical adenopathy, red throats, coughs and the like were very exceptional. Were it a bite, I would expect older children to come down more frequently. We know that children under three years old are seldom victims of the first case of contagion in a family, yet, here we have fifty to sixty per cent. of our cases in this age limit. Children under three years are not frequenters of the hot beds of disease. These children are largely home bodies. We do know that gastro-intestinal troubles are very common under three years. Food, milk, water, animal pets, toys and trade in sputum, qualify as factors for the young child as well as the older. Milk, food, and water factors especially apply to the children under three years. The mouth, rather than the nose, is the baby's storehouse. The tonsil and the gastro-intestinal tract follow in the track of the mouth. Very few of our cases have had inflamed tonsils. The nasal atrium seems hard to accept. The State Board of Health of Illinois reports similar paralysis in a proportion of cases among the domestic animals. Chapin, in Massachusetts, reports likewise. I exposed four roosters quite closely to infection with no results. Recently I have observed four postmortems and without the history of the case the gross diagnosis would be very doubtful. A little congestion of brain and cord, some enlarged mesenteric glands, some congestion in the bowel lining, some prominence of the gray matter of the cord or brain, were all the things you could see marked. The mesenteric glands would tend toward the intestinal idea. The incubation period is said to be five to sixteen days. One to forty days are given as extremes. The susceptibility to poliomyelitis does not seem great, much less than measles or scarlet fever, for example.

Symptoms: The symptoms are those of a wide spread or scattered poliomyeloencephalitis with meningeal involvement. Owing to the age of the cases, the onset description is lacking very often. Observant mothers have usually noted some fever, vomiting, constipation or diarrhea, loss of appetite, listlessness, hypersensitiveness and drowsiness. This coming suddenly on a child at this season, formerly well, should arouse suspicion. A physician may note the tenderness, a stiff

neck, pain on flexing the back and an ataxic gait. The patient often refuses to walk, and if they do, are easily tired and wish to be taken up. Convulsions may have occurred in some instances; paralysis is the first symptom noted. Older children may complain of headache and pain in the limbs, of a sore throat and perspiration. In some instances the patient is attacked with a high fever, a convulsion, or several of them, and then he is comatose, or in semicoma, for a few days, from which he rallies with a group of muscles, few or many, paralyzed. The fever may last for a few days but as a rule is of short duration.

From personal conversation with patients over ten years of age, the following stories of the onset have been obtained:

Case 1. Was in swimming. Noticed a stiffness in the chest. Got out of the water and felt better. On returning to the water felt the stiffness again. Went home and worked the next day but the arms were stiff and painful. The following day the right arm became helpless, and within twenty-four hours the left also. This case had marked tenderness in the arms and severe pains with the paralysis.

Case 2. Complained of pain in the feet, then the arms. Had a very severe headache and finally lost his voice, so that he could just whisper. In five or six days he had an almost complete spastic paralysis of the arms and legs with facial involvement.

Case 3. Complained of pain in the right leg. Considered it due to playing hard the day before. Had headache and felt drowsy. Next morning the right leg was paralyzed. The leg was very tender.

Case 4. The first thing noted was a chilliness, then a pain in the leg, which was paralyzed. This case stayed home from school to avoid it.

Case 5. Was very nervous, could not sleep, had a severe headache, could not hold head up, dizzy. Finally got to sleep and awakened with arm and leg involved in paralysis after the ninth day of illness.

Case 6. Had a headache and was constipated. Second and third day had a little sore throat. Felt better and tried to go upstairs and noticed he could not stand on his tiptoe, seven days after the onset. He could not walk upstairs very well.

Case 7. A fruit peddler, after a severe diarrhea of seven to ten days, noted that he had hard work to walk; his limbs pained and were stiff. He went to a doctor, who considered it a probable rheumatism. He went home and could not walk after that and rapidly developed a respiratory paralysis, causing death.

Case 8. (From intelligent mother.) Child vomited, no fever, was listless, it was hard to get him out of bed. Had to arouse him for feeding; was very irritable. The vomiting was persistent, nothing would agree with him. A physician was in constant attendance and no fever ever noted. After three weeks of vomiting more or less paralysis of the right arm was noted.

Case 9. The child went to the country with parents for a day's visit. Vomiting and diarrhea followed the car ride, supposedly. Fever appeared and child became comatose. Four days later a facial paralysis was noted.

Case 10. Child was on a boat trip. The mother noted when she got off the boat that she staggered. Vomiting, diarrhea and a high fever followed, with an extensive paralysis of one lower extremity.

Clear mentality, headache, rigid neck, tenderness, hypersensitiveness and peculiar gait go especially with poliomyelitis. Other symptoms of any infectious process may be present,—vomiting, sore throat, diarrhea, perspiration.

The onset of paralysis in 100 cases in this city, according to Dr. Armstrong's data, was as follows:

Same day.....	4 cases	5th day after..	11 cases
1st day after..	13 cases	6th day after..	2 cases
2d day after...	25 cases	7th day after..	0 cases
3rd day after..	28 cases	8th day after..	1 case
4th day after..	14 cases	9th day after..	2 cases

One case under my observation had been sick for three weeks before paralysis developed.

Cases are not as a rule hospitalized before paralysis, so observations of pulse, temperature, respiration, blood and spinal fluid data are not available in our records. In over 180 cases in the hospital we have seen but one convulsion, and no coma. The highest temperature on entrance was 107° F. In a series of twenty cases the average temperature on entrance was 100.9° F. The highest respiratory rate on entrance was 40 in this series of twenty. The highest pulse rate was 160 with a temperature of 104.8° F. In the respiratory cases marked frequency of respiration is the rule, and before death may reach 80 to 100 in the medullary type. When the diaphragm and respiratory muscles are involved the respiratory rate is very slow and just a gasp takes its place. These patients may be kept alive for many hours by artificial respiration.

The paralysis may develop suddenly or it may develop slowly, extending one, two or three days. In one instance I saw it spread over ten days and in two others over five or six days. In this class the paralysis spreads from one group to another until the maximum is reached. Sometimes the paralysis is so complete that the patient lies mo-

tionless. At other times but one muscle is involved.

However complete the paralysis, it is quite characteristic of the disease that after a short time—three or four days to three weeks—the paralyzed muscles begin to recover. In some they do not. Any muscle of the body may be involved and the paralysis, as a rule, is of low motor neuron type. In encephalitis, meningeal and bulbar cases there may be spastic paralysis.

In one case of a series of ninety the motor oculi nerve was involved. Ptosis was seen but once. The external rectus was involved in one instance. The face muscles were involved in five cases out of ninety. The facial is very easily overlooked unless you cause the child to cry or laugh. The palate was involved in one, and in one only have the pharyngeal muscles been paralyzed. Ten could not hold up the head; eight had some respiratory paralysis; eight had paretic abdominal muscles. One had paralysis of the triceps only; one had paralysis of the deltoid only. One had paralysis of both deltoids only. Five had paralysis of all extremities with the exception that on one hand the fingers and on one foot the toes might be moved. Four cases had paralysis of both limbs and one arm combined. One had a left facial and a paralyzed arm and leg on the right. The most common paralysis is that of the quadriceps extensor. The perineal, gluteal and gastrocnemius paralyses are common. In a series of fifty, fourteen had a one-legged paralysis, nine a two-legged paralysis. I have seen no paralysis of the adductor of the thumb.

Paralysis of the arm is not exceptional. In a series of 50 cases the arms were involved in 12. Deformities developed early in some of these acute cases.

Rigidity of the neck is a common finding, as is tenderness on handling. Flexion of the spine is frequently painful.

Leucocytosis is a very constant feature, one of the most constant as to laboratory findings. I have seen no leucopenia. The leucocytes average 12,000 to 15,000 continuing often up to the fifth week. It is present with normal temperature, pulse and respiration. The differential sometimes reveals four to six per cent. eosinophilia, but in most cases the differential shows only polymorphonuclear leucocytosis. The lowest count is 6,500, the highest 34,000. The urine is usually negative. Throat cultures for Kleb-Loffler are uniformly negative.

The spinal fluid is clear, the cell count of lymphocytes is increased; it averages 30 to 50 per cubic millimeter. The lowest I have seen on entrance to hospital is 3 and the highest 104. It may reduce Fehling's in about 50 per cent. of the cases. Increased pressure has been infrequent. The Nonne and Ross Jones' tests are positive in 60 per cent. of the cases. A coccus has been found in the fluid by Dr. Nuzum in eight out of nine cases.

The tendon reflexes of the paralyzed muscles are gone. The reflex may be gone and yet the paralysis not be complete, merely paresis. The gait of acute cases is very hard to determine for the great majority with leg involvement are unable to walk by the fifth week.

The facies of a patient very sick with poliomyelitis is quite characteristic. Often there are grimaces or chorea-like movements. The little patient follows your movements with its eyes, not moving its head. The eyeballs are often sunken and the color is ashen. The patient may have closed eyes while you are examining, be in a drowsy condition, but arouses easily. With delicate electrical instruments there is said to be found a disturbed sensation. Chills, convulsions and herpes are not often seen after entrance to the wards.

Abortive cases seldom reach the hospital. In epidemics many cases of meningitis with good recovery, influenza, gastrointestinal disturbance and cases of fever with no findings are probably poliomyelitis without frank paralysis. Some show a weakness if examined carefully. They probably comprise twenty-five to thirty per cent. of the cases.

In addition to the abortive and spinal type, anterior ascending paralysis (Landry's), bulbar paralysis, acute encephalitis, ataxic meningitis are recognized types, as classified by Wickman.

After the constitutional symptoms abate and the paralysis has reached its maximum, a period of calm comes which is tedious but which is often lightened by marked improvement. Some patients that could not walk begin to do so, others begin to sit up, but a few do not change much. In this time some atrophy, some contracture, may be noted. A few may remain very tender and the

respiratory cases are very slow to breathe correctly. The abdomen and chest seem to play "teeter-totter" with each other—the abdomen goes up and the chest goes down and vice versa, but the excursion of the abdomen is greater. The diaphragm alone carries on the respiration seemingly. Whether the paralyzed muscles ever completely recover I don't know.

Complications and Associations. Bowel disturbance has been frequent; diarrhea at some time occurred in 16 per cent. of the cases. Eight of this series passed macroscopic blood in their stools. Weight disturbance is a feature; six of this series lost weight to a considerable degree. Marked distension of the abdomen was noted in five cases. One of my series developed spasmodic croup. Herpes is rare; I have seen it but twice in looking over 180 cases. Impetigo was seen in one case. Bronchitis was seen in two cases. Pneumonia (lobar) appeared in one case out of 180. Contractions develop in two or three weeks in some instances and not in others. Retention of urine occurred in two cases out of 180.

One young man after four weeks in bed with a deltoid paralysis could not walk because he had kept his knees flexed. This cleared up in a few days. I have seen no bed sores on back. One head decubitus was seen.

Diphtheria germs were seen in one case out of 180. The gonococcus was found in three cases out of 180. Syphilis was present in two cases out of ninety. Scarlet fever was present in one case. Nasal discharges were seen in 3 cases, one with syphilitic snuffles. Gangrene of vulva was present in one case. Excessive perspiration and cold, paralyzed members were noted in 5 per cent. of the cases; otitis media in one case; abscess on chest wall in one case; dislocation of hip in one case.

DIAGNOSIS.

The sudden onset of paralysis or a weakening of the muscles of erratic distribution in a child in the late summer with symptoms of infection, is quite characteristic of the disease. This paralysis and the characteristic spinal fluid are two important diagnostic points of the paralytic stage.

The preparalytic diagnosis is suggested by headache, stiff neck, hyperesthesia, irritability, drowsiness, clear mentality and ataxic gait. These together with fever, perspiration, vomiting, constipation, diarrhea, difficult micturition and defecation, sore throat, convulsions and delirium sometimes, make a very strong suspicion, which lumbar puncture may confirm. Early lumbar puncture should be resorted to, to diagnose before paralysis.

In the late cases, sluggish circulation, cold extremities, atrophy, lost reflexes, reaction of degeneration, and former history usually clear up the case.

Certain difficulties have arisen in differentiation, but as a rule no other diagnosis fits a case of poliomyelitis. Parturition paralysis usually involves the deltoid, biceps, brachial and supinator longus, synergistic muscles which poliomyelitis may affect. Both are lower motor neuron types and the picture clinically is the same. The history of birth injury, of the presence of the paralysis from birth and sensory disturbances which are rare, would speak for the birth trauma. Paralysis of some other groups of muscles and infection history, would indicate poliomyelitis. Hereditary ataxia may exhibit lost reflexes with no sensory changes and appear in children. The chronic course, several in a family, deformities of the feet, hyper-extended toes, would aid in the diagnosis of the ataxia.

The acute course of poliomyelitis with sudden paralysis afterwards improving or stationary differentiates it from cord affections with flaccid paralysis, atrophy, reaction of degeneration; but the latter are progressive and chronic. They are usually symmetrical, may occur in families and atrophy often precedes the appearance of paralysis. The atrophy in these cases is the much more prominent symptom. Paralysis is the prominent feature of poliomyelitis with atrophy secondary.

Acute diffuse myelitis presents bladder and rectal disturbance, bed sores and sensory alteration while atrophy and degeneration reactions are not features of prominence. Spinal meningitis does not present paralysis but stimulates the preparalytic stage of poliomyelitis of the meningitic type exactly. Lumbar puncture results might differentiate them. Tumors of the cord and brain usually develop slowly. Sarcoma of the cord may bring on symptoms with amazing rapidity and with fever. Sensory changes and localizing symptoms would aid in differentiation.

Dr. Marshall of Michigan called attention to such a case. Choked disc, local spasms, vomiting, pulse irregularity, late coma, convulsions, and a progressive spastic paralysis, would favor tumor of the brain.

Polyneuritis usually presents marked tenderness over the nerve trunks and cutaneous sensory disturbances, but the polyneuritic type of poliomyelitis would simulate it exactly. The causal factors, the history of infection, the course and progress of the paralysis would help to clear it. Polyneuritis is toxic and usually symmetrical. Poliomyelitis is an infection and usually not symmetrical.

The cerebral type of poliomyelitis could easily be mistaken for the cerebral palsies. The history of the case, the character of the paralysis, and the mental condition of the patient if the poliomyelitis came after infancy might be of aid. The infection phenomena are not a part of the palsies. The course of the two is different.

Hysteria, especially in the adult, is always a consideration. It came up in one of our female adult cases. The entire clinical picture must be observed, globus, crying, laughing, limited vision fields, absent pharyngeal and corneal reflexes, psychical conditions and unmotived changes of nervous manifestations may permit a hysteria. I do not believe the hysteric can feign absent reflexes and reaction of degeneration. An anesthetic might clear a diagnosis if the paralyzed parts were moved during the second stage of anesthesia.

Hoover's test might be of value in a feigned paralysis.

Bell's palsy gives some trouble also. It is not so frequent in children as in adults. It is not an infection. The spinal fluid would not present the changes of poliomyelitis. This type of paralysis simulates poliomyelitis exactly.

Brain abscess may simulate poliomyelitis. The causal factors of an otitis media, the onset and course of the case, the mental condition and the clinical picture as a whole do not fit in with poliomyelitis. The paralytic features of abscess are seldom like poliomyelitis.

Meningococcal, pneumococcic and influenzal meningitis are made positive on finding the germs in the spinal fluid. Tubercular meningitis may be very difficult to differentiate in certain instances where tubercular meningitis starts in suddenly and when the poliomyelitis is of the encephalitic and meningeal types. Tubercle bacilli may be found in the fluid by the Loeffler method. The cell count is usually higher in tubercular fluid. Primary tubercular foci may be noted in the lungs or pleura. However, the focus may be glandular and obscured. Choroidal tubercles may be found. The courses of the two are usually different, the tubercular usually being longer. The paralysis of a low motor neuron type also would point to poliomyelitis, but the encephalitic type of poliomyelitis would present a spastic type. A Kernig might be present in either one or the other instance. The von Pirquet and complement fixation tests for tuberculosis might be aids. The injection of a guinea pig with cerebrospinal fluid might clear up the diagnosis from the scientific standpoint, but for the case at hand it would be of no help. A case of poliomylelitis in a week's time is usually better or worse. As far as the acute phase goes, such a history for tuberculosis is not common.

Rickets and scurvy may cause a pseudo paralysis but examination of reflexes and positive findings of rickets or scurvy would clear them up.

Diphtheritic paralysis may be puzzling. It may simulate poliomyelitis in all particulars. The history of the case, possibly positive cultures and the presence of palatal and eye paralyses should put one on his guard. These cases of diphtheria usually recover sooner than poliomyelitis.

Typhoid fever may be simulated before the onset of paralysis. One of our cases was suspected of typhoid in the preparalytic stage which lasted a week. The headache, drowsiness, fever, bowel disturbances and general aching led one to think of typhoid. The cardinal points of each disease separate them.

Inflammatory rheumatism in children is frequently mistaken for poliomyelitis. Careful examination of the reflexes and joints would differentiate.

Lues came up in several of our cases and was an accompaniment in two instances. Poliomyelitis does not give a positive Wassermann in the tests we have made. Lues is not so selective in its choice of anterior horns as poliomyelitis as a rule. The course and progress are usually not similar. Syphilis comes up for differentiation in the adult cases.

Trichinosis has been simulated in two cases. The blood count for eosinophilia and examination of a piece of muscle and the spinal fluid for trichinæ clear up the cases.

Influenza, tonsillitis, beri beri must also be considered. Congenital myatonia (Oppenheim's disease) presents flaccidity and absent reflexes from birth.

Hip joint disease, dislocation of the hip, arsenical poisoning or other affections which careful examination of reflexes and degeneration reactions will clear up. Joints with atrophy and disuse of the muscles, casts left on for long periods of time, may look like poliomyelitis, but the reflexes, etc., would clear them up.

PROGNOSIS.

The prognosis as to life must be guarded. You never can tell when a respiratory paralysis will carry your patient away. This paralysis of respiration may develop very suddenly when a case has been progressing well. In two instances I have observed records of patient doing well or no change and death occur within a few hours. As a rule, you may say there is little danger to life provided the medulla oblongata is not involved, or the fourth cervical or its neighbors which supply the diaphragm. After the paralysis has existed six or seven days chances of death seem remote from poliomyelitis, but other things may claim your patient. Cases involving the glossopharyngeal, pneumogastric or heart centers must be prognosed very doubtfully. The average mortality of this series of ninety was between seven and eight per cent. Most of the deaths came between August 16 and August 31. In the last fifty cases there has been but one death. In some epidemics the mortality reaches twenty to thirty-three per cent.

Regarding recovery, improvement is the rule, but it is hard to prophesy concerning this. A little one muscle paralysis may show little improvement and an extensive initial paralysis may diminish greatly. It is said that muscles that show no reaction of degeneration after fourteen days will recover. At the onset you cannot say how extensive the paralysis will be. Usually the paralysis comes quickly and does not spread after a day or two. In three instances I have seen it spread after six or seven days of paralysis, and in one instance after ten days of paralysis. Recovery may continue for some months and perhaps years. You may see a patient with four extremities paralyzed and speech affected nearly well in eight weeks. Another patient much the same may show little improvement, or even succumb with spread of the disease to the medulla. Bad omens are high fever, rapid pulse, restlessness, convulsions, coma—which is rare—severe ileocolitis, disturbance of respiratory muscles and inability to swallow.

Deaths in this series were as follows:

1. Child entered with a temperature of 102° F. and paralysis of one extremity. After six days in the hospital respiration began to increase and death occurred from medullary involvement.
2. A man entered the hospital at 8 p. m. after fifteen to sixteen days' illness before paralysis. He had a bronchial irritation. Death occurred inside of ten hours from respiratory and cardiac paralysis.
3. A child paralyzed in all extremities. Sick the fourth day; doing well at 3 p. m. At 9 p. m. respiration increased in frequency and death occurred the next morning from respiratory failure.
4. Gangrenous vulvitis with ileocolitis caused death on the sixteenth day.
5. Ileocolitis caused death after three week's illness.
6. Man sick three weeks. Paralysis of six days' duration. Could not swallow; ptosis and irregular pupils; paralysis of both quadriceps; urinary incontinence. Death with extreme cyanosis and rapid respiration.
7. Death with convulsions and temperature of 110° F.

PROPHYLAXIS.

Notification of the board of health, isolation of the patient, quarantine of contacts and disinfection are proper until we know more of the dissemination. The closing of supervised schools is doubtful. Funerals should be private. Children's parties, movies, Sunday schools, public halls and assemblies should be avoided by children. Persons to be avoided are convalescents, abortive cases and healthy contacts who may be carriers.

From experiments urotropin may have some value in prevention and I would be inclined to recommend it not only for its scientific value, but its psychic effect also. Anything but some mild oil would be irritative to the case in the long run. Hydrogen peroxide, 2 per cent. solution, kills the virus.

In view of the doubt concerning intestinal infection, it would be prudent to be sure of pure milk, pure water and uncontaminated food. Penny slices of melon, partnership candy, dirty cones, impure ice and ice cream, unwashed fruit

and vegetables should be guarded against. Children should be taught not to put foreign articles into the mouth. Sneezing and coughing might scatter the virus. The exchange of sputum is probably a great factor in most of children's ills. Visitation of sick children by well ones should not be tolerated. To telephone is safer for both parties. Pets, domestic animals, dust, flies, mosquitos, secretion and discharges of bowels, kidneys, eyes, nose and throat must be managed according to well known scientific principles. Exposure to long, cold rides in autos, or exhausting games may lower resistance.

The production of an immunity like smallpox vaccination, or typhoid, or against rabies, would be very fine if we had it. The rarity of the disease would make the procedure questionable, but the increase of epidemics may produce such a demand.

When we know the manner of spread I expect these measures will seem ridiculous. At present we never think of isolation, of trichinæ, yet epidemics may appear.

Carriers, convalescents and abortive cases should receive prescriptions appropriate to get rid of the virus. Keeping paralyzed extremities or parts in proper position may avoid later contractions and deformities. In Chicago cases are isolated for five weeks.

TREATMENT.

Absolute rest and quiet, hygienic measures, antipyretis by drug or hydrotherapy, analgesic, dietetic, symptomatic and expectant treatment are similar to any other acute infection. Frequent change of position, woolen stockings and undershirts with arms are proper. Following the absence of tenderness and pain, light rubbings and massages with warm baths are probably of help. Our children apparently did better when, after pain and tenderness had gone, they were allowed to try to use the affected members. Absolute rest is supposed to lessen spinal irritation. But to make a child under three years old rest, is a gigantic task which only splint or casts can accomplish, and even then they will try to move the cast, and in so doing, I imagine might put their spine or pelvis out of plumb. Observation in this series leads me to believe that power is obtained quicker, atrophy is less and convalescence shorter in the victim that can be gotten up after two or three weeks. When once some motion returns psychic conditions are also much improved. A few children in the ward that are improving rapidly are a great help to the paralyzed. Imitation in children is highly developed. If all patients are kept in bed the little fellow remains quiet, but if a few are up he wishes to be up also. Electricity has not been tried in these cases.

Hemorrhage, edema, exudation and anemia pathologically account for some of the symptoms which may be transient and yet threaten life if near the center of respiration. Posture may influence edema and hemorrhage. The blood supply of the anterior cord comes mostly from the vertebral, which in the spinal canal is a long, slender artery, the outer longitudinal. With cord edema and hemorrhage it would be reasonable to think that the prone position with the head lower than the buttock might be safer. In the brain and cord, elevation of the head would seem reasonable. In respiratory cases propping them up aids some of them. Theoretically external applications to the spine might influence circulatory disturbances.

Exudation may be an indication for the iodides, but in my opinion not in the acute stage. Anemia of ganglion cells because pressed upon might be relieved by posture or by sending more blood to them. Increasing the blood pressure might accomplish this function. Dr. Meltzer's recommendation of adrenalin intraspinously would be based on the idea of lessening hemorrhage, edema and anemia, it seems to me. Adrenalin increases the blood pressure, is a powerful heart stimulant and acts locally on the meninges and cord. Its action soon diminishes and the injection must be repeated in a few hours. Possibly adrenalin may have some specific effect in addition to its other powers. I have observed its use in a few cases only. In one instance there was apparently some good result from it. In another the pulse jumped from 66 to 136 and the result *in toto* was negative. Lumbar puncture may relieve increased pressure and thereby anemia. In no case have I seen marked evidence of an increased intracranial pressure, but it was marked in some of the New York cases.

Measures to kill the virus are uncertain. Urotropin in the canal is in an alkaline medium and powerless. In children urotropin causes hematuria quite frequently. I saw it in three

instances this autumn. Methylene blue injected into the blood or by mouth does not reach the spinal fluid. In ten cases we gave methylene blue before lumbar puncture but did not find it in the spinal fluid. The spinal fluid seems to be sacred and I doubt if many remedies given by mouth or hypodermically reach it. Injection of antiseptics intraspinously has been recommended, such as protargol. Inasmuch as the virus permeates the cord and brain it is difficult to see how a local antiseptic can do a great deal.

Measures that would increase the opsonins, stimulate leucocytosis, locally or generally, increase bactericidal action and enhance agglutination or neutralize toxines of the blood, if brought to the cerebro spinal system, would be on the side of assets. Nonspecific proteins may increase leucocytosis generally, locally increase opsonin and increase bactericidal qualities. Under this heading comes serum from recovered patients. It has been shown that this serum contains antibodies often for many years. This serum is injected intraspinously and intramuscularly or intravenously. It is done daily. It was used in seven of my cases. Judged by controls it was difficult to see a specific action. Other foreign proteids, as antidiphtheritic serum, antidysenteric serum and horse serum have been used. From observations of controls and lack of numbers of cases I could not recommend them with supreme confidence, but I believe the immune serum or the foreign proteids come the nearest to a treatment that we have.

In the respiration paralysis propping up on a pillow and adrenalin intraspinously may give a temporary respite. From observation, a case of Dr. Hoyne's artificial respiration seems to work better than a pulmotor in conscious patients, and such cases of poliomyelitis usually are conscious.

In the future we must diagnose poliomyelitis before paralysis and use measures to prevent it. Whether this will be a serum, an antitoxin or a chemical, I do not know, but it is sure to come. The alternative may be to prevent it as we do typhoid, rabies, smallpox and diphtheria.

DISCUSSION

In answer to Dr. Churchill, we have used the immune serum in nine cases. This serum was used on very sick cases only, and the rate of mortality was high. It was given intravenously in some and both intraspinously and intramuscularly in others.

In regard to emetin hydrochloride, Dr Tenney's remarks were most interesting to me. I have used it in two cases. The presence of blood in the stools of these cases led me to think of dysentery very strongly. This led to the use of antidysenteric serum, which, like any foreign proteids or possibly from some specific action, does produce a good result as far as high temperature, rapid pulse and respiration go. Paralysis is produced by the dysenteric germ in the instance of rabbits, as Shiga records in his article on dysentery. This I am able to confirm and in five instances caused a rather typical flaccid paralysis in rabbits with the Shiga organism.

INDICATIONS FOR DECOMPRESSION.*

WILLIAM H. PERRY, M. D.
STERLING, ILLINOIS.

The surgery of the nervous system has now become to a large extent the work of specialists and requires study, special training and special tools. There are, however, certain operations with which every practitioner should be familiar, and able to do in an emergency. In this paper I wish to call your attention to the *indications for operative treatment of skull fractures* and I will try to show when such treatment is necessary. To recognize the necessity and proper time for any surgical procedure is just as important as to be able to do it properly.

Some type of decompression is employed in every operation of brain surgery. Puncture of the ventricles or spinal puncture are almost of equal importance. The exposure of the brain is not now considered more difficult or dangerous than laparotomy. While this paper will deal with the symptoms appearing after skull fracture and concussion, let me say in passing that almost the same set of indications appear in brain tumor, abscess, and meningeal hemorrhage.

The number of skull fractures met with in our practice is certainly increasing. While this increase may be accounted for by the general increase in population, and the increased hazards of industrial life, I think a new element in our industrial and social life has been more prolific in accidents of all kinds and of skull fractures in the same ratio, than any other thing; I refer to the extensive use of the automobile. The cheaper they become, the more they are used. Every Monday of the vacation season and following other holidays the morning paper tells of the toll of lives taken and of the injuries sustained

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the day before. As we are certain to meet with emergency more frequently than ever before, I feel that we should take advantage of some things learned in brain surgery in the past few years and possibly conserve the lives of some of these unfortunate victims.

Kocher was one of the first to call attention to the significance of increased pressure within the skull following lesions of the brain. His classical paper on the stages of brain compression set forth a fundamental fact which he showed must be considered in establishing a rational treatment for all pathologic conditions within the skull. He states that increased cerebral tension from whatever cause is the great indication for decompression. Such being the case I wish to discuss the factors entering into the increased pressure and some of the untoward results of it.

A brief review of the literature of skull fracture for the past ten years does not give promise that past methods of treatment have been improving the mortality statistics. Ransohoff in 1910 collected 190 cases treated in the previous ten years at the Cincinnati Hospital. Sixty-five per cent were fatal, 10 per cent or 19 were operated upon with 7 recoveries. He is pessimistic regarding improvement in cases subjected to palliative treatment. Seventy-nine per cent. of fatal cases died inside of two days. Lumbar puncture was thought to be of value and decompression the best procedure. Besley in 1915 collected 1,000 cases treated during the previous ten years at the Cook County Hospital. Mortality 53 per cent. He calls attention to the fact that *seventy-three per cent of the fractures were associated with basal fracture*, although only in 33 per cent of the cases was it recognized clinically. This is an important observation, because if no depression is palpated it may not be thought necessary to do an operation. But if 73 per cent of all fractures extend to the base where hemorrhage may complicate and raise pressure, it may explain why some blows on the head thought to be trivial are fatal.

There is no record of the results of treatment, palliative or surgical, in this series of cases, but in a paper read several years ago by Dr. Besley a comparison of results showed a slightly lower mortality in these operated upon. In a personal communication he says that his experience is now "quite convincing, and that in the future he will do more decompressive operations for symptoms that indicate increasing intracranial pressure regardless of whether that pressure is due to hemorrhage or edema."

Cushing says that "subtemporal decompression is often of great benefit, indeed actually life-saving in many cases of basal fracture."

Elsberg states that "patients with signs of fracture of the base as soon as signs of increased pressure appear should be subjected to a subtemporal decompression."

Heurer, of Baltimore, states that "the present opinion is that decompression is indicated, even though the lesion be a fracture of the base or of the vault without depression of fragments, in cases in which acute pressure symptoms are increasing, as indicated by changes in the state of unconsciousness, rise of blood pressure, slowing of the pulse, changes in the respiration, and that this procedure offers greater hope of recovery in his opinion than palliative measures."

Sharpe, of New York, states that "after a consideration of the literature upon the subject and as result of experience quite extensive, he is of the opinion that the operative treatment for selected cases of fracture of the skull showing signs of intracranial pressure, is far superior to the expectant treatment, and that the operation most suitable for these cases is the subtemporal decompression."

The brain is enclosed in the inelastic dural membrane. The falx cerebri is a downward extension of the dura enclosing the longitudinal sinus and forms a fairly strong partition between the hemispheres. The tentorium is a horizontal extension dividing the cerebrum from the cerebellum. When a lesion occurs in one of the three compartments thus formed the expansion is more or less limited for a time to that particular compartment and the symptoms produced are localized. In this way the cerebellum and medulla are protected from immediate pressure effects, due to lesions of the cerebrum, and as medullary pressure is the cause of the fatal symptoms appearing in brain trauma, it seems that nature has wisely protected it in a way. Outside of the dura is the rigid bony skull. It does not yield to increased pressure, except in childhood, hydrocephalus due to obstruction of outflow of cerebrospinal fluid will cause a separation of the sutures and an expansion of the brain cavity. Thus it follows in the adult that local areas of

increased pressure soon reach their limit of local expansion and the pressure then is transmitted equally in all directions according to the laws of hydro-dynamics. Unfortunately the structure of the skull does not give the desired complete protection to the important centers at the base of the skull. Recalling Besley's observation that 73 per cent of fractures reach the base, you will note that hemorrhage is liable to do direct damage to the most important part of the brain in about three-fourths of all such accidents. This may be accounted for if you will hold a skull with cap removed up to the light and you will find the horizontal plates forming the bases of the three skull fossae to be not much thicker than heavy wrapping paper. The effect of blows on the vertex or blows transmitted upward through the spine is to drive the condyles of the atlas into the weakest part of the protecting bones of the brain cavity. Fractures of the base and about the foramen magnum damage the most important vital centers of the medulla and in a great many cases cause death before any kind of relief can be given.

Another factor to be considered in connection with brain pressure is the cerebrospinal fluid. It is secreted by the choroid plexus in the third ventricle, passes into the two lateral ventricles or back into the fourth ventricle and thence through the foramen Majendie into the meninges and spinal canal. To a certain extent the brain and cord float in it. It is believed to re-enter the circulation by means of the pacchionian bodies and the cortical veins. Its amount is determined by many factors. Secretion and excretion may change its amount. Rising blood pressure, and lesions of the brain, especially traumatic, will increase it. When the amount does increase the lateral ventricles expand, the cortex is flattened out on the inside of the skull, causing anemia of the cortical cells. As a result signs of degeneration appear. Numerous small cortical hemorrhages have been found following concussion. Both factors are to be considered as a possible cause of the post-traumatic neuroses found in some cases of head trauma. These consist of persistent headache, dizzy spells, changed personality, depression, excitement, and general nervous instability.

The recognition of increased brain pressure is made by observing the state of consciousness, the pulse, respiration, eye and tendon reflexes, and the use of the ophthalmoscope. The eye grounds exhibit the most reliable signs of cerebral tension. At first only a distension of the retinal veins, later a haziness of the disks, finally choked disks, with edema often obscuring the vessels.

Kocher has attempted to give a logical explanation of the effects of brain compression and has divided them into four stages:

At first the pressure, whether acute or chronic, expels the cerebrospinal fluid and as the brain tissue is incompressible like water, it compresses local blood vessels, thus reducing the amount of blood. The cerebral veins become dilated and a venous stasis results. This causes headache, drowsiness and possibly stupor. Retinal veins are much dilated. The first stage represents the individual's efforts to force sufficient blood into the brain to supply his needs.

In the second stage the pressure is still rising. If a local lesion such as hemorrhage is present the pressure is confined to that particular compartment. As already stated the falx cerebri and tentorium would protect the other compartments from immediate pressure. Should the fracture occur in the lower or occipital fossae there is at once extreme medullary compression with serious disturbance of respiration and circulation. Finally local pressure becomes general all through the cranial cavity and anemia of the cortex and medulla follows. The effect on the medulla is to produce a slowing of the pulse to 60 or less, and at the same time stimulation of the cardio-vascular center raises the blood pressure still more. Headache becomes more severe, delirium or convulsions may supervene, marked cyanosis is seen, and the ophthalmoscope shows dilated veins and edema of the disk. This is the favorable time to interfere. As long as the blood pressure is rising and the pulse slowing it is proper to operate. After the turn comes with a falling blood pressure, increasing pulse rate, and Cheyne-Stokes respiration, it is usually too late to hope for successful results. The third stage represents the major signs of medullary compression. The increasing intracranail pressure produces extreme medullary anemia and were it not for the regulatory mechanism of the circulation, death would follow. Fortunately the absence of blood stimulates the vasomotor center and the blood pressure is raised still higher to overcome the lack of blood in that important region. So that a temporary anemia is fol-

lowed by an increased motor activity of the cardiovascular system. Clinically this "down" and "up wave" presents a striking picture. The down wave due to medullary anemia results in a slowing of the heart down to 50 at the same time pulse is full and bounding, the respiration becomes slower and slower until it ceases for a time. It has been found that the blood pressure also lowers somewhat, the stupor becomes deeper, the pupils dilate and the reflexes are abolished. Then the vasomotor center is stimulated into activity again, with rising blood pressure blood is forced into the medulla again, the heart rate increases, respiration increases and breathing becomes more frequent as the respiratory center is supplied with blood. Double choked disks are seen and the veins of scalp and eyelids are engorged during this stage.

The fourth stage represents the final extreme medullary compression. The vital center becomes fatigued and after one of the down waves the respiration fails to resume. The heart continues to beat rapidly and irregularly as a separate organ, until the blood pressure falls to zero, when paralysis becomes complete, the pupils are dilated, muscular relaxation complete and death is inevitable.

Subtemporal decompression is designed to avert the untoward results of intracranial tension. Cushing's technique is now given in the later text-books. The dura should always be opened. Right sided decompression should be employed usually, except in left-handed persons, in order to prevent a hernia of the motor area of the cortex. The opening in the bone should be of generous size. Blood clots can be washed out from under the temporal and frontal lobes, meningeal hemorrhage checked and gutta percha drains inserted into the base, if hemorrhage cannot be reached. If depression has occurred at any other site, that site should be selected, the bone fragments raised, hemorrhage controlled and drainage inserted.

Double decompression is used by Elsberg more frequently than single and with better results. Occipital decompression must be employed for subtentorial lesions as the pressure is not relieved by operations higher up. Puncture of the ventricles is routinely done to remove accumulation of cerebrospinal fluid.

Conclusions: First, a lesion of the brain, causing increased intracranial pressure, is the great indication for decompression.

Second: It is our duty to employ this procedure to relieve it, regardless of the cause.

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FOCI OF INFECTION ABOUT THE TEETH.*

W. T. CLARK, B. S., M. D.,
FT. ATKINSON, WIS.

The teeth and gums placed as they are in a constantly and abundantly infected cavity are admirably situated as atria of infection. The flora of the mouth probably consists of some thirty or more organisms. Miller placed it as high as one hundred. This large number exist in symbiotic relationship, upon their host normally, without causing harm, but it is readily seen that any slight disturbance in their relations, one to the other, or with their host, may readily lead to diseased conditions and invasion of the surrounding tissues and the blood stream.

The more important ones are the streptococcus, especially streptococcus viridans, staphylococci, pneumococci, Bacillus aerogenes capsulatus and the ameba. Noguchi has also isolated a spirillum. Hertzell has found the Streptococcus viridans in practically all apical abscesses.

Bearing in mind Rosenow's work on the transmutation of the streptococcus and the results he has obtained in producing such lesions as arthritis, endocarditis, gastric ulcer, etc., emphasizes the importance of the teeth with regard to systemic infection.

There are two principal modes of entrance about the teeth. First, that around the gingival margin, and second, through the pulp chamber and root canal.

The gingival margin entrance furnishes us first with gingivitis and second with pyorrhea. Gingivitis is an inflammatory condition of the gum around the tooth caused by the traumatism of food particles, and the resultant infection. This is the beginning of more severe trouble and is the stage which gives the warning signal for early care, by heeding which much more serious

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trouble may be avoided, as there is yet no destruction of tissue. There is first an abrasion of the mucous membrane which allows the entrance of infection. Black goes into the pathology of these conditions in which there is a deposit of calculus upon the teeth. He says that the deposit of salivary calculus causes marked destruction of all the surrounding tissues, including the bone; that these deposits are soft for the first fifteen to twenty-four hours and may be easily removed with a brush but soon become hard. The conclusion as to prevention is easily drawn. If our school inspection was more generally in use, and the children taught the advantages of proper methods of care of the teeth they would take their knowledge back into the home with wonderful results in the field of preventive medicine. The dentist and physician should lose no opportunity for instruction along these lines. The process is slow and the school age is the age of greatest tooth destruction.

The causes and treatment of pyorrhea are much discussed at present. Many contend for the ameba and emetin treatment while others say that the ameba has no causal relationship and that emetin is of no value. Certainly much of the ameba-emetin literature was premature and the burden of proof still lies with the sponsors. However, it seems that emetin is of value along with proper scaling. I am convinced that it will not cure but that with persistent treatment it will hold the process of destruction in check in the mild cases. It is unreasonable to say "cured" in the face of the pathological changes which have taken place, i. e., destruction of peridental membrane and alveolar process. Those cases which have advanced well up the side of the tooth and in which pus pockets have developed I do not believe can be made safe short of extraction of the tooth. A reasonable effort should be made to save these teeth. But again, our greatest field is prophylaxis. We cannot expect any form of treatment to reconstruct lost tissue. Lack of care, irregular teeth and poorly fitted crowns and bridge work are predisposing factors.

Apical abscesses originate usually at the apices of dead teeth from infection of the root canal, which is not entirely filled, or from the putrefying pulp which has not been entirely removed. The prophylaxis here lies with the dentist in using aseptic measures in the preparation of root canals and the development of a more perfect method of properly filling them. It is needless to say that the dental profession is alive to the situation and a new era is being instituted in dentistry. These abscesses may also arise as a secondary infection by an obliterative endarteritis or from systemic disease or arteriosclerosis, phosphorous poisoning, etc.

Hertzell has found ten out of twenty healthy and practically all dead teeth bearing Streptococcus viridans at the apices.

Every dead tooth, whether filled, crowned or bridged, should be suspected of bearing an abscess unless otherwise proven by every test, including a radiograph. The slightest fraction of an inch of unfilled root canal is sufficient to account for an abscess. This does not necessarily reflect on the dentist's work as some roots are so tortuous, it would be impossible to fill them to the end. The practice of dentists who have conscientiously tried to conserve teeth by filling, crowning and bridging, we find has given rise to troubles of more severe nature than the loss of the teeth conserved and means a different viewpoint will have to be maintained with regard to the teeth in question. The consensus of opinion at present being that every tooth bearing an abscess or granuloma should be subjected to immediate extraction or root resection if there are systemic symptoms. Both of these procedures are based on sound surgical principles. If not causing systemic symptoms, and the patient can afford treatment at the hands of a specialist, the tooth may be conserved, but if it is not possible to clear up the infection it should be subjected to radical treatment. In other words all foci of infection should be cleared up whether causing noticeable trouble or not—and I say noticeable advisedly—because many times a patient is not up to par and is not conscious of the fact because he has been below par so long that he has become accustomed to it, but upon removal of a focus of infection he is relieved of some condition with which he had lived so long that he considered it normal.

We all recognize the care required in entering a joint in other parts of the body and yet the pulp chamber and root canal of a dead tooth, situated in an infected cavity, has been entered with very little attention to asepsis. We must also bear in mind that a dead tooth is a foreign body, as by the destruction of the peridental membrane the normal relationship of tooth and

process has been disturbed. It is only by consideration of all these conditions that we are able to appreciate the great task that rests with the dental profession in dealing with dead teeth. To treat a dead tooth properly is a delicate and exacting piece of work which will require more time and will be much more expensive. Consequently, it is going to require an immense amount of education of the public to enable them to realize the importance of, as they consider it, "simply filling a tooth." Here again we can be of aid in pointing out the importance of having the work done properly, if at all.

The results of these conditions are what we as physicians are interested in and when we find such an array of diseases, some of which have been obscure in their etiology, not only traced to focal infection somewhere, but as has been done in many instances, traced directly to the teeth and cure obtained by proper treatment, it behooves us to make a practice of a thorough routine examination, including an x-ray of the tooth, and much closer association with the dental profession becomes imperative.

The role of the teeth in rheumatism has been definitely proven. The chronic arthritides also have been traced to the teeth and been cured by removal of the foci of infection. Tonsils have been found to harbor the ameba and clean up when a co-existing pyorrhea was relieved. Secondary anemia, appendicitis, colitis, cholecystitis, gastric and duodenal ulcers, iritis, sinusitis, and nephritis have all been proven to be due to focal infection. Some skin diseases such as erythema nodosum, herpes zoster, etc., come under this heading and recently Rosenow has reported some very interesting results on "Elective Localization of Bacteria in Diseases of the Nervous System." Among the diseases included are transverse myelitis, multiple sclerosis and multiple neuritis, neuraligia and sporadic anterior poliomyelitis.

Craig, I think, reported twenty cases of melancholia which showed no improvement until a co-existing pyorrhea was cleared up. I am at present observing a melancholia which had a very severe pyorrhea and badly infected tonsils. Rheumatism and pneumonia are among those diseases which have a tendency to recur. Hertzell reports a case of pneumonia coincident with the removal of the bicuspid yielding the Diplococcus pneumoniae in large numbers. This surely suggests that we should at least try to discover a focus of infection in those who have had one or more attacks of pneumonia, realizing that the infection may be constantly carried, requiring only a lowered resistance to cause a transmutation or increased virulence in the culture already at hand.

The importance of the radiograph may best be realized when we consider that a tooth does not need to be giving pain or even be sensitive to pressure to give rise to systemic absorption and it is only by means of the x-ray, in addition to the usual diagnostic methods, that such abscesses may be diagnosed.

The x-ray is not infallible and too much has been expected of it, but it is absolutely indispensable. Some seem to forget that the radiograph must necessarily depend on some alteration in the density of the bone, thereby giving a difference in the shadow cast, that is, some decalcification must have taken place in order to show a change. Sometimes it does not show an abscess or granuloma where one is present and it may show an area of rarefaction where no infection exists. In our enthusiasm to locate the focus of infection, we must not forget that the mouth, as the seat of disease, may not be the cause, but the result of general conditions such as syphilis, diabetes, etc. Such possibilities serve to emphasize the great interdependence of the dentist and physician.

In view of the unsettled opinion as to the value of vaccines and our present lack of knowledge as to what element of the vaccine is of value, if at all, in the light of Rosenow's work upon the transmutation of bacteria when removed from the original host and placed upon artificial culture media or upon another host, and bearing in mind that upon the removal of the focus of infection, there is a reaction in the secondary foci of infection, I venture to suggest that in so far as possible we use the vaccine in the original site. In this way, it would seem reasonable to suppose that we would get the utmost liability of clearing up secondary foci which might be undiscoverable or inaccessible to elimination. In illustration of this point, I wish to report the following case, with the full realization that "one swallow does not make a summer" and that it is often fallacious to reason from premises based on a single case.

Mrs. B., aged 56 years, came to me complaining of pains in the chest. They were neuralgic in character,

covering the whole thorax, with a tender spot in the dorsal spine. Chest findings were negative. Upon examination I found eight lower teeth remaining badly affected with pyorrhea, all of which were beyond hope of preserving. She had pain and tenderness over the gall bladder and appendix and considerable digestive disturbance. These conditions were all of from six to fourteen years' standing. I advised the extraction of two teeth at a time at intervals of about two weeks, and she did as directed, but lengthened the periods between extractions to three to six weeks. After the extraction of each pair of teeth, she experienced a decided aggravation of all symptoms related to the spine, thorax, gall bladder, and appendix. After having the last two teeth extracted she was in bed for several days. Since that time her symptoms have cleared up entirely and her general health is much improved.

White says that all foci should not be eradicated at once for two reasons, first that cultures may still be obtained for making vaccines if there has been a failure to get a culture at the first attempt, and second in order not to overwhelm a patient unable to bear the severe reaction due to the elimination of all foci at once. I would give as an additional reason the hope that it may arouse sufficient reaction to clear up secondary foci of infection. This is offered as a suggestion to be proven or disproven by more complete observation.

ON THE CLINICAL ASPECT OF CARDIAC INCOMPETENCE.*

GEORGE RICHTER, M. D.,
Professor of Medicine, National University; Visiting Physician, City Hospital.
ST. LOUIS, MO.

An insufficiency of the heart's action will occur in the moribund. It is the cause of death in possibly one-half of all the cases. Incompetence of the heart appears in the large majority of cases of protracted illness, in acute and chronic infectious diseases, but also in those afflictions which we may combine under the name of wasting, constitutional, degenerative diseases, anemias and cachexias. In all such, however, other symptoms arouse our attention much more than the condition of the heart.

What I wish to describe and analyze is that stage in which an unsatisfactory function of the heart appears to be of pre-eminent importance, in which clinical observation makes us assume that reestablishment of efficient function would save the patient.

Heart failure may be recognized by the general appearance of the patient: we can differentiate it from other, similar disturbances even on a superficial survey of the case. The face is usually pale with a yellowish tinge; lips tongue and finger tips are cyanosed. Slight edema below the lower eyelids, also about dependent parts of the body. Breathing is uneasy, often irregular, yet not so labored as in bronchial asthma; there is no prolonged expiration, no stridor, no wheezing. Dyspnea becomes more marked on exertion, particularly at attempts to hold a conversation. The cough, though usually moderate, is exhausting, expectoration often frothy and may show strings of blood, or appear thick, muddy, rusty from an admixture of blood. The expression of the face is characteristic, a distress, an anxiety quite different from that in bronchial asthma. The skin may be covered with a cold perspiration. The patient is restless but feels that every movement aggravates his condition. Carotids pulsate visibly, jugular pulsation is much in evidence and of special interest to us. The veins on the arms are prominent. A sitting posture is sought, with the body bending forward. He may complain of pains in the region of the heart, in the left shoulder and arm (mistaken for rheumatism), in the epigastric region with a desire to belch, or also in the region of the liver, which together with a slight jaundice has been diagnosed as cholecystitis. A herpetic eruption on the inner aspect of the arm is rare but typical. Gastric troubles are occasionally due to injudicious medication. Palpitations are not always complained of. The symptoms due to angina pectoris and to heartblock complicate matters still further, but cannot be dwelled upon at present. Cardiac asthma occurs in the form of attacks of rapid breathing, lasting a few minutes and repeating after short intervals, while in angina pectoris respiratory excursions are small, and in heart block the Cheyne-Stokes type of breathing more frequent.

The sufferer is apt to be very irritable, even irrational, particularly on awakening from a much disturbed sleep.

The edema mentioned before is usually local, found at the dependent parts, in the bedbound about thighs, buttocks, lumbar region. It is due,

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of course, to venous stasis, as also an occasional ascites, when the liver is engorged. The edema may vary on successive days and disappear from the subcutaneous tissue to persist in the muscle substance, imparting to the same a peculiar firmness against the flabbiness of other limbs.

The Cheyne-Stokes type of breathing does not mean an absolutely grave condition, but it is annoying to the patient. It occurs when he would fall asleep and awakens him to full consciousness.

The pulse is often bounding, soft, or hard or thready, not always irregular in force and rhythm.

On percussion we discover dullness at the right side of the sternum corresponding to a dilatation of the right auricle, proven by pulsating jugulars. Dilatation of the right ventricle produces epigastric pulsation of a more diffuse character than that due to a pulsating abdominal aorta in neurasthenia. It may simulate a pulsating liver. Dilatation and hypertrophy of the left ventricle displace the apex beat towards the axilla.

On auscultation we may find a variety of murmurs which are not always referable to valvular disease. Great dilatation and weakness of the muscle ring around mitral and tricuspid valves prevent exact closure resulting in a leakage, and thus a diagnosis by auscultation becomes difficult.

One or both of the lower lobes of the lungs will exhibit some dullness due to congestion with rales, becoming universal in pulmonary edema.

The liver is frequently enlarged and tender on palpation.

Urine is scanty, high colored, rich in uratic ("brick dust") sediment, of high specific gravity with more or less albumin and usually few casts, except in a complicating active nephritis. There is always urobilin present (not often bile pigments) and diminution of chlorides.

In the scanty sputum we discover the characteristic heart disease cells, but rarely pus cells. Microscopic examination of the blood reveals little of interest, while the chemical contents may be much altered in proportion. This examination, however, is not within the scope of the general practitioner.

All these symptoms vary, of course, in intensity and are not combined in every case.

The one chief cause of all of this is exhaustion of the heart muscle.

The exhaustion may be due to overwork. Increased work of the heart from increased resistance in the periphery, f. i. in arteriosclerosis, in very long continued muscular over-exertion, in gross valvular defects or stenosis. They lead to dilatation and hypertrophy, which at first compensate the fault. During the period of compensation a person may have marked valvular alterations with concomitant changes in the pulse and loud murmurs, yet enjoy health and be able to perform all the work ordinarily imposed upon him. During such a compensation there is no call for any other but hygienic measures and all medication is distinctly harmful.

Though the well compensated hypertrophied and dilated heart may still possess considerable reserve power for occasional increased tasks, there is without any doubt a limit to it; great additional labor will induce a breakdown, initiate an incompetence.

Myocarditis is by far the most frequent cause of heart failure. An infection which sets up an endocarditis with valvular disease will practically always also attack the myocardium, the heart muscle.

A myocarditis without endocarditis is apt to follow diphtheria, typhoid, pneumonia and very frequently influenza. Sudden death from this cause is not rare after diphtheria. Syphilitic myocarditis with its slow and insidious progress may remain occult for a long time.

Myocardial degenerative processes are usually focal. Plasma-cell exudates are converted into strands of connective tissue, displacing and weakening muscle fibers, interfering with proper contractions.

Also adipose tissue in the obese may crowd the contractile substance.

Now let us see, how an incompetence may proceed in developing such symptoms as just enumerated. It will help in understanding the situation and give us ideas as to rational treatment.

Take a case of aortic regurgitation from extensive valvular destruction. The left ventricle propels the blood into the aorta with each systole. Diastole sets in. The aortic valves don't close properly, some blood rushes back into the left ventricle. Simultaneously the contents of the left auricle are forced into the left ventricle, which receives more blood than normal, dilates and, in order to expel this increased

content hypertrophies. The left auricle in its effort to empty itself into a partially filled ventricle meets increased resistance. It dilates and hypertrophies, but not to a great extent, not enough to perform the increased task completely. Therefore, back-pressure blood begins to dilate the capillaries of the lungs. The systole of the right ventricle throwing blood into the lung circulation meets an increased resistance from the blood damming up there. The right ventricle dilates and hypertrophies. This affects the right auricle which finds increased difficulty in emptying itself into the right ventricle. The right auricle bulges and now the blood from the cava veins encounters a positive instead of a negative pressure. The venous flow is impeded. The blood is forced back into the jugulars, it fills the liver, the abdominal organs, the kidneys, etc. The surface veins swell up. Capillary circulation is sluggish, re-acting back upon the arteries and thus increasing blood pressure in spite of a weak heart.

Exactly the same history may be given for the other valvular defects. Those of the left heart must necessarily affect first the lungs while those of the right heart must show their primary influence upon peripheral venous stasis.

In myocarditis we may expect a combination picture with a preponderance of a more manifest weakness of the right heart with its thinner walls.

But this does not take place simultaneously everywhere nor in the same sequence. It is well known how the blood supply to the various organs changes according to temporary functional requirements. The vascular apparatus of the lungs is regulated rather by the energy of the right ventricle than by vasomotor influences. The supply to the brain varies very little. The two principal reservoirs of the blood which have a function to compensate each other are the vessels of the body surface, regulating body temperature, and those of the abdominal viscera, large enough to eventually hold the entire blood content of the organism. Either territory is regulated by the autonomous nervous system, the vagus and the sympathetic, independently of the heart itself. The heart propels certain fixed amounts. These are distributed unequally to the various organs, conforming with their temporary needs. Hypertrophy of the left ventricle associated with certain diseases of the kidneys indicates a special co-ordination between the two organs. The condition of the walls of the vessels merits attention. When organic functions have become impaired the blood itself is altered. It damages the endothelial lining of the vessels, renders it more permeable to serum—edema. And this again may be local or universal, while the now altered condition of the tissues in general, of the kidneys especially, accounts for albuminuria, retention of chlorides, urea, creatinin and other products of metabolism, causing more damage.

We may now attempt an explanation of the various symptoms in detail.

Dyspnea is the first symptom, manifest on exertion like climbing stairs, prolonged conversation inducing an increased pulse rate. How is this to be explained? The needs of the organism call for the oxygenation of a certain amount of blood within a unit of time. The weaker heart throws less blood into the lungs, less is oxygenated. Absence of oxygen stimulates the respiratory center, forcing an inhalation earlier than before. Air hunger—dyspnea. Deep inspirations are prevented by rigidity of the congested lungs, the crowding by a dilated heart or also by an enlarged liver. The faster heart action tends to compensate for this.

These facts furnish an excellent test for the heart function, by noting the exact time in seconds during which a person can hold the breath, which should be at least thirty seconds. With an incompetent heart this time is very materially shortened, and again increased on convalescence. In estimating the heart's condition by the pulse rate, psychic factors must be considered and estimated.

Venous pressure is estimated by observing the veins on the back of the hand. On elevating the latter to the height of the heart, or a trifle above it, these veins should collapse. If not, then there must be an increased pressure at the right heart.

Another important method of testing the force of the left ventricle, is acquired only by some practice. It consists in palpating the apex beat and determining the force necessary to suppress its propulsion. Even a very pronounced apex beat is compatible with a weak heart, when intercostal spaces are wide, thin and muscles

weak. Blood pressure is no reliable indicator for the heart's power. Pressure may be very high when an increased peripheral resistance (in edema) or contracted arteries oppose the blood current.

The congestion of the lungs may be the result of a very slow process. There is an increase of interstitial connective tissue. Capillaries bulge out into the lumen of the alveoles. Red corpuscles and some leucocytes emigrate (diapedesis). The erythrocytes are taken up by desquamating alveolar cells and leucocytes; phagocytosis, digestion of the reds is begun, hemoglobin is broken down and partially converted into hemosiderin, visible as brownish-yellow enclosures of irregular size and shape within the cells, without previous staining: the "heart disease cells." It is quite interesting to look for such cells to differentiate between an ordinary bronchitis or asthma, and the above described condition; "brown induration of the lungs." In the latter case expectorants are of little avail: the heart must be treated. As to pulmonary edema I must refer you to the text books.

In another series of cases the lungs suffer little, as in primary disease of the right heart, excepting through a diminished supply of blood. Dilatation of the right ventricle prevents prompt closure of the tricuspid, blood walls up in the jugulars, in the veins of the body. The liver becomes engorged, swells, tears on the peritoneal capsule, causing pain; bile capillaries are occluded, bile is absorbed, a slight icterus appears. Portal circulation suffers; ascites is noted. All the vessels of the mesentery are over-filled. Absorption is diminished. As a sign of parenchymatous liver trouble urobilin (not bile pigments) shows in the urine. But the visceral symptoms are not only the result of mechanical processes, they are much aggravated by vasomotor phenomena. These vasomotor signs I believe to be due partly to an overcompensation, partly to an exhaustion of regulating functions. When the venous system is engorged, arterioles of the skin (and elsewhere) contract, to keep up the required pressure for the blood to circulate at all. The sluggish circulation in all the viscera affects also the suprarenal glands, less adrenalin is offered to the system. Normally adrenalin constricts the vessels of the viscera; here it fails.

Congestion of the liver from an incompetent heart is probably more frequent in those whose liver furnishes a place of diminished resistance, in those who have had severer infections, or who have been living high, indulging in excess of food, alcohol, or who have had a lack of exercise. Hemorrhoids occur very often.

Another class again is that of the cardio-nephritics. Hypertrophy of the left ventricle, general edema, marked albuminuria with all kinds of casts, eventually with uremic symptoms. It is not at all easy to state whether the trouble was primarily cardiac, or primarily nephritic. We may often assume that the same infection which attacked the heart, also infected the kidneys. In these cases cerebral symptoms may be found, due to a localized edema of the brain, or focal arteriosclerosis, with pathologic reflexes (perhaps only on one side); Babinski, Chaddock, missing patellars and Achilles, unequal pupils, etc.

An incompetent heart favors formations of thrombi with subsequent embolism, as infarct of the lungs. Angina pectoris, heart block may be added to the general picture. They simulate pneumonia, pleurisy, asthma, cholecystitis, gastric crises and a number of similar conditions. A careful analysis of the symptoms should guard us against such harmful errors.

The prognosis is in many cases much more favorable than is generally assumed. It depends less upon the condition of the valves than upon that of the myocardium. And myocarditis is by no means always a hopeless condition. Of course, he who would fill the patient indiscriminately with digitalis will have poor results. Properly administered it may prevent an incompetence, but in heart failure it is apt to prove a failure.

To treat an incompetence we will have to consider the condition of the heart and the complications, which we may expect to improve materially together with an improvement of the heart's actions.

Where the substance of the heart is not materially impaired, where it is simply exhausted from overwork, like a tired skeletal muscle, remedial measures which strengthen the heart are indicated.

A tired organ needs rest. Comparative rest for the heart is sought by relieving it as much

as possible from unnecessary work. The latter may have been imposed upon it by consuming too much liquids, by irregular contractions and by too high a blood pressure, often due to increased peripheral resistance (in general edema), unnecessary work may also be caused by contracted arterioles, by roughened surface of the arterial wall, by increased viscosity of the blood, by circulating toxins (nicotin), by the rather mysterious relations to the kidneys, and of course also by irreparable valvular disease. Finally also, and this is important, by mental excitement, by worry and cares, in those of an excitable, "nervous" disposition.

Besides rest a tired organ needs proper food to supply what had been wasted. Such food can be furnished only by proper circulation of blood in the walls of the heart, through the coronary vessels.

Where the heart is not only overworked but has suffered damage from inflammatory processes in myocarditis with degeneration and loss of contractile fibers (or also interference with conduction of stimulus) we must hope for the formation of new fibers to make the loss good. Experience gained in hypertrophy renders such a possibility plausible.

How can we meet these indications? Only a general sketch can be given. Where symptoms are so much interwoven, no detailed advice is possible.

Rest is by far the most important. Anything increasing the heart-rate is detrimental, therefore all worry is very harmful, and its opposite, cheerfulness, a great aid in treatment. Absolute bodily and mental rest, aided by bromides, enforced by opiates!

With convalescence carefully graded exercise will re-establish more energetic functions.

Irregular contractions call for digitalis and similar drugs. Digitalis is most helpful in disturbance due to the vagus. But only too often does it fail to give the expected result. It will disappoint in gastric disorders and in engorgement of the liver. Too slow an absorption, too long a stay in the sluggish portal circulation and within the liver prevent it from reaching the heart unchanged.

Here rectal medication should be tried. Tincture of digitalis, Digalen, or tinct. of strophanthus injected into the rectum above the external sphincter reaches the lower hemorrhoidal plexus, thence the cava inferior and the heart on the shortest route. Injection higher up would let it enter the upper hemorrhoidal plexus that empties into the portal vein.

The hypodermatic route is too painful. Intramuscular injections are less objectionable.

Most wonderful, almost instantaneous results are achieved in appropriate cases by intravenous injection of strophanthin. The effect lasts forty-eight hours, after which the dose may be repeated.

But where an extensive myocarditis has weakened the heart muscle, it must not be whipped up by such remedies, which then fail. Relief can be obtained here by rest, proper food and untiring patience.

The only food for the heart is glycogen, forming from carbohydrates, from sugar. It should be furnished in abundant, digestible amounts.

Fluids must be restricted. Every drop absorbed is propelled by the heart. On such restriction the "Karell Diet" is based, with which the patient receives only one-half pint of rich milk four times a day and absolutely nothing else. It is particularly useful in general edema. On the third day of this rather cruel starvation diet an abundant diuresis usually sets in spontaneously. It is a practically salt-free diet and to be recommended.

A general edema is also promptly relieved by intense sweating, thus reducing peripheral resistance and relieving the heart of that much of a load. Pilocarpin should be used with great caution. Dilatation of the vessels of the skin dilates those of the kidneys and favors diuresis. Chilling the skin is therefore dangerous.

Purges are apt to weaken the patient. With this form of elimination not only much of the food eaten, but also much of the patient's strength, is carried off.

Diuretics also disappoint frequently. At times they set up a gastritis. In persistent edema of legs (or universal) relief is obtained by drainage with Southey (Curschmann) trocars, or multiple incisions of the skin, aseptically of course; as much as one or two gallons may flow out in 24 hours.

The universally praised calomel is a kidney poison and must be avoided in nephritis.

To regulate the vasomotor apparatus in a cer-

tain direction, namely, as far as the sympathetic proper is concerned, we have at our disposal an ideal drug, adrenalin. It constricts the visceral vessels, lifts the sunken blood into circulation, dilates the coronaries and insures a proper nutrition of the heart; fifteen minims (1:1000) may be injected every hour if necessary. Here its effect on blood pressure does no harm.

The most alarming symptoms, if associated with hypertension and cyanosis, are promptly relieved by venesection, drawing 8 to 16 ounces of blood. One must have witnessed it to appreciate its miraculous effect.

In other cases a hypodermic of neutral camphor in oil, 3 grains, often repeated, has been life-saving. Strychnia is helpful, but not very reliable.

By all such measures a hypertension is usually relieved. But a high tension may be necessary to maintain kidney function. As a general rule very low blood pressures give a bad prognosis.

Metropolitan Building.

HOME TALENT.*

GEORGE K. WILSON, M. D.,
STREATOR, ILL.

At a meeting of the La Salle County Medical Society several years ago at which the attendance was excellent, a member arose and said that he desired to express his appreciation of the excellent program and attendance and that he also desired to say that one of the things that made for an interesting meeting was the reading of papers by men from outside the county; that he had observed that the members would not attend to hear a paper by one of their own number.

To conform to this idea of an interesting paper, I bring a little from the world's first essayist of whom it has been said "He was one of the profoundest thinkers, one of the keenest observers and one of the most learned men the world has ever produced."

He said, "Studies themselves do give forth directions too much at large except they be bounded in by experience. They teach not their own use, but there is a wisdom without them and above them won by observation."

Of medical studies nothing could be truer. We may study and study, but if we do not practice and gain experience by observation the studies are largely without value because of their generalities.

Doctors of medicine begin practice with the same knowledge, that is, they begin with all they could glean from a prescribed course of four years of studies. The paths diverge. At the end of one year or of ten years, the members of a class that were together for four years with the same studies, developing the same ideas and learning the same facts, present no two members with the same experiences or the same observations.

It increases the knowledge of anyone to meet any other and exchange experiences and observations. In fact this is the way medical knowledge is accumulated. Experience and observation added to the studies increase the store.

The experiences and observations of a La Salle County man or of a Streator man should be as interesting as those of any other county man, and should not be held in contempt by Streator or La Salle county as manifested by lack of attendance at a society meeting.

To hold in contempt the words of a contemporary is perhaps as old as the beginning of thought. It is not new and today we may be losing as much in La Salle county and in Streator by maintaining this attitude as did the contemporaries of a thousand and one immortal men we might name beginning with Noah and coming on down through the centuries.

Leaving the advantage to be gained by the general profession by listening to the experiences and observations of all members, let us turn to that which is to be gained by the individual in the telling of his experiences to others.

Again we go to our friend, Lord Bacon:

> Whosoever hath his mind fraught with many thoughts, his wits and understanding do clarify and break up in the communicating and discoursing with another; he tosseth his thoughts more easily, he marshalleth them more orderly, he seeth how they look when they are turned into words; finally, he waxeth wiser than himself, and that more by an hour's discourse than by a day's meditation.
>
> Neither is opening the understanding restrained only to such friends as are able to give a man counsel; they indeed are best, but even without that, a man learneth of himself and bringeth his own thoughts to light. In a word, a man were better relate himself to a statue than to suffice his thoughts to pass in smother.

It has been well said by a member of this club that the man who gains the most by the presenta-

*Read before the Streator Medical Club.

tion of a paper is the writer himself. It makes him think, it makes him observe and if this club should become a real, live, successful club, Streator would have a better class of practitioners and each one of us would have more interesting, agreeable and valuable contemporaries.

And so we might continue philosophizing, but this is a medical paper. A case has been selected for report tonight, not because of its intrinsic value, perhaps, but merely to illustrate the truism that one should look in his own dooryard for the wonders before searching the world for the four-leaved clover.

The case, so far as I am informed, is the only one of its kind that has ever been observed in all the world in all time.

When a medical man desires to make such a statement, he goes to the medical literature and searches for the report of such a case. I have not read of such a one in my own library and it is too inconvenient for me to search the larger ones. However, I have a reprint of a paper written by Dr. Reuben Peterson in 1905 in which he intimates that he has searched the literature for cases of migratory uterine fibroids. He abstracted the twenty authentic cases he found, and added three more. In going over these cases I find not one like unto the one of tonight.

Two years ago a childless woman of sixty years came complaining of a pain down the back of the right leg.

Examination revealed a large pelvic tumor.

Shortly afterwards this patient came to operation and a hysterectomy, leaving the cervix, was done. Two tumors were found. One, a large one, being situated in the posterier uterine wall; the other, the size of a small orange, appeared as a tumor of the right ovary with no other attachment except a frail, cobweb adhesion to the small intestine.

Microscopically the uterine tumor was an ordinary myofibroma; the ovarian tumor revealed no ovarian tissue or derivative of ovarian tissue, but did resemble the structure of uterine tissue, that is a uterine fibroid, even though to all appearances the tumor was a direct outgrowth of the ovary.

To the general practitioner this perhaps has no significance; a tumor is a tumor; but to the pathologist this would be as strange as it would to the agriculturist to dig his potatoes and find beets in the hills. A farmer, in his right mind, can always distinguish a potato from a beet, and so a pathologist should always distinguish between a section of ovarian tissue and one of uterine tissue.

As the farmer might "reckon as to how" a potato could produce a beet, so the pathologist theorizes how a uterus can be the outgrowth of an ovary.

He might first think of inclusion; that is, in the process of fetal development a few of the cells that were to become uterine tissue might have been included in the ovary and in later years produced this fibroid.

Another explanation is that this might have been a pedunculated fibroid lying in contact with the ovary; a little twist of the pedicle, a little inflammation on the surface of the tumor, an adhesion to the ovary; more twist, more adhesion, and so on until the blood supply of the pedicle is destroyed and the pedicle disintegrates and frees the tumor from the uterus, meanwhile a new blood supply to the tumor from the adhesions keeps it alive and the adhesions organize until they form such an intimate attachment as to be unrecognizable to the naked eye.

So we might go on theorizing how this tumor or its beginning became so intimate with the ovary. However, this is not so strange because there have been at least twenty-three such cases. There is a stranger condition connected with this tumor; that is:

It was infiltrated with medullary squamous-celled carcinoma.

Such a case, a migratory uterine fibroid being infiltrated with carcinoma, as I said before, so far as my knowledge extends, has never been recorded.

A microscopical examination of the uterus revealed an apparently normal uterus with the exception of the intramural fibroid, which easily shelled, the left ovary was normal and the cervix was not excised.

Most of the ovarian tumor, and a large piece of the uterine tumor were preserved; the balance was thrown away. There was not enough knowledge present to recognize that a rare specimen was being handled and it was not routine to save specimens for thorough examination.

The ovarian tumor was sectioned and carcinoma found in the tumor, but not in the ovary; the uterine tumor was sectioned and no carcinoma was found; the cervix was left and at the end of two years is atrophied and shows no sign of carcinoma. From whence did the carcinoma come? From the body of the uterus? Perhaps; I do not know. I threw the body away. There were no macroscopical signs or clinical symptoms to indicate the presence of carcinoma in this body. If there was, why was the uterine tumor free?

Many times have I regretted my destructive tendencies and desired a section from that body. It would perhaps shed light upon the origin of this carcinoma which lends such interest to this tumor.

Carcinomata cannot just grow, they must come from epithelial cells and usually we do not expect to find epithelial cells in a sub-peritoneal fibroid. Perhaps the patient may yet reveal the source of these cells.

In summing up we can say that the case presents an extraordinary, and a very extraordinary, aspect. The extraordinary is the finding of a uterine fibroid lying in the pelvis detached from the uterus and attached to the ovary. The very extraordinary circumstance is that the fibroid is infiltrated with carcinoma.

Returning to the text of this discourse, sup-

pose, for the sake of the argument, we admit the truth of the proposition that this tumor is the only one of its kind. Then it should have as much interest for us even though it blossomed in Streator as it would had it been picked in Chicago.

However, for interest to be developed in this club, it is not essential that only the extraordinary should be reported and discussed, even the ordinary cases are interesting if we desire to make them so.

From a medical standpoint, Streator is not radically different from other places. Pneumonia, typhoid fever, anterior poliomyelitis, etc., are of the same nature and have the same characteristics and reactions here as elsewhere; hernias, appendectomies, cholecystectomies and thyroidectomies are the same in Streator as in the rest of the world. We have the same anatomical and physiological bodies to observe; we even have brains ourselves the same as other men. All we lack is a little ambition, a little energy to have medical meetings of as great interest with home talent as with foreign.

If we cannot get our feet out of the clay and must cling to the material aspect, be assured that the man who does enough work so that he can write an interesting paper for the Streator Medical Club will not go unrewarded. The effort required to produce such a paper cannot but react upon the man and develop him until even the public can discern that he is a better man than the one who puts forth no such effort.

During my residence in Streator, a source of great irritation has been the general impression both among the laity and the doctors themselves that home talent is deficient and when any citizen of prominence or any citizen with a surgical or medical disorder needs medical services he must step to Chicago or have Chicago step to him.

I believe that this impression originated in Chicago and has been developed by the medical profession of Streator and when emergency arises, the idea bobs up just as it does when we desire an interesting meeting.

Furthermore, I believe that the power to change this impression lies in the members of the profession itself and that if each man could be stimulated to forget the art and think more of the science, it would not be long until Streator doctors, that is, home talent, would have as eminent standing as foreign talent.

FUNCTIONS AND PROBLEMS OF A MEDICAL SCHOOL INSPECTOR.*

DUDLEY W. DAY, M. D.,
ROCKFORD, ILL.

After many years of agitation and of teaching by object lesson, the time has undoubtedly arrived when arguments to show the need of and benefits to be derived from medical school inspection are no longer necessary. We now have school inspection as a well founded department of the educational institution. Our work of today and of the future is the further perfection of the work we are already doing and the enlarging of and reaching out for new functions. The importance of medical inspection, the fact that it is of basic importance to the pedagogic phase of the school curriculum, is just dawning upon the great body of teachers, the great body of physicians and the greater body of parents.

In the popular mind the principal functions of the medical inspector are supposed to be:

1. Control of contagion.
2. Control of school sanitation.
3. Examination for simple defects such as diseased tonsils, adenoids, etc.

My title calls for a discussion of the "problems" of a medical inspector. It is my experience that these simpler functions just enumerated really do furnish numerous "problems." When the family physician is appealed to because the school doctor or nurse has excluded Mary for nothing but a little cold or cough which she has every year at this time, he, the family physician, should remember that possibly the department of hygiene is bending every effort to nip in the bud an epidemic of measles or whooping cough. It is very easy to say that it was all foolishness to exclude Mary, but really, does it help the community?

In school work, as in no other line of medical work, I believe one learns the very high infectiousness of the early stages of practically all infections. School inspection and the epidemiological studies thereby made possible are teaching the medical profession that epidemics spread by direct contact and by direct contact almost entirely. Detect and isolate the infected individuals and an epidemic disappears. The frequent clamor of parents, too often incited by physicians, to close the schools because of the presence of an

*Read before the Tri-State District Medical Society, Freeport, Ill., Sept. 26, 1916.

epidemic, is good evidence that we still have a wide field needing education. If, together with your school closing, you absolutely isolate each child you will surely secure the desired end, at an unnecessary loss of time, education and increase of expense. Efficient inspection plus noninterference by, and moral support of, the medical profession will control quickly and cheaply practically all epidemics. I have no criticism of the present closing of schools to prevent the spread of poliomyelitis, but it is very evident that the order is based on our ignorance of the disease. We are simply repeating the history of our other contagions which are now well understood.

None knows better than the school inspector of experience that in the diagnosis of physical defects, honest differences of opinion are entirely proper and inevitable. In much of his work the school physician is under a decided handicap. He is limited in facilities, equipment, and extent of examination procedure and yet is supposed to make fewer mistakes than were he working in his own private office. The majority of children who come to examination have proven themselves a problem in some way or other. Either the teacher or nurse has detected an apparent abnormality, or the child is backward, or a problem in discipline. Let me impress upon you that in many of these cases the school diagnosis is tentative and is made to get the child to you, the family physician, and thus secure your thorough examination, advice and co-operation. Let me suggest that often the family physician may increase the value of his advice by inquiring into a child's school activities. I believe it true that a given abnormality in a normal child may call for different advice than the same abnormality in a subnormal child.

One's activities in school service soon carry him into different fields than those just mentioned. Preventive medicine, the different types of mental abnormalities, social service to the community, the whole co-ordination of health and mind in the individual and in the mass are less well known activities which are really the most important functions of medical inspection.

Here let me emphasize the very great value to any community of the school nurse. The properly founded nurse has a value unique unto herself and her place cannot be filled by any physician. She can do more social service and bring parents into closer touch with the school than can any other worker.

In our modern high-speed existence we are beginning to realize the needless and criminal waste of preventable disease. Note that I say "beginning," for medical men know how far we fall short of completely profiting by our knowledge. One of the most encouraging signs of progress is the fact that communities are learning that the time to cure tuberculosis is before it has developed. How much preferable to develop the underfed subnormal child into a healthy one in the open air school, than to support the same individual a few years later in the municipal tuberculosis sanitarium. Let him develop tuberculosis and he spreads the disease, takes longer to cure if such be at all possible and, in plain language, he costs more to the taxpayer.

In Rockford today we are developing an unusual co-operation between the trustees of our Municipal Sanitarium and the Board of Education. The open-air school is built and maintained by the sanatorium and the education is furnished by the school system. We believe we thereby furnish ideal conditions for an open-air school and prevent needless duplication of equipment and expense to the taxpayer. How better can a sanatorium serve its important function of prevention?

Another needless waste which we are striving by medical inspection to eliminate is that of the child who enters the competition of school and later that of life the victim of some physical defect which is subject to correction. In no place can the adenoid, the diseased tonsil, or the defective eye be as generally detected and properly dealt with as in the school examination. The struggle for existence today is too keen and the plane of physical and mental efficiency too high to allow needlessly handicapped individuals to compete.

Probably no child is today the subject of more study, conjecture and experimentation than is what may largely be classed the backward child. Inquiry by any of you in your own city will elicit the knowledge that there is a very large percentage of children who at some time during their school period have to repeat one or more grades one or more times. In Rockford last year 37 per cent. of our children were backward; 59 per cent. of these were 1 year below; 26 per cent. two years, 9 per cent. three years, and so on down.

There are many types of "backward child." I will speak here of only three types, namely: First, the child backward because of some removable physical defect; second, the dull child, not really mentally defective, but just dull at least for a few grades; and third, the true mental defective.

All of these types are proper material for the medical department. The correct treatment for physical defects, the first type, is evident. Often the proper treatment is much more evident than is the means of securing it. I am still enough of an optimist to believe that some day in the future there will be universal laws which will put the welfare of the public before personal privilege and give us a means of compelling parents to give their children the benefit of proper remedial agents. It is a heartbreaking experience to watch an adenoid case year after year, see him failing in his studies, being stunted physically and yet be unable to secure the simple needed relief. Many of these problems are our problems, in that education and publicity must come from us, as a profession. A wonderful amount of knowledge concerning these matters has already been brought home to parents. We should be proud of our work, but must not think it is complete.

The handling of the dull child, the second type, is comparatively simple when once he is correctly classified. This child faces two dangers. One is to be considered a normal child and to be expected to do the work of a normal child; the other to be considered a true mental defective. In this field the school physician finds difficult problems. It is often only by long continued cooperation between the pedagogic and medical departments that proper diagnosis can be made. In making diagnosis all phases of the child's life have to be taken into consideration; his heritage, his personal history, his physical and mental health, his habits, his home influences and companions. These children should be under special instruction in special or ungraded rooms. Every precaution must be taken not to stigmatize them as mental defectives. We are all familiar with the dull child who suddenly develops into the keen, efficient adult when he finds his special niche. Perhaps the future in psychanalysis holds the solution for us of these cases.

When we come to the true mental defective I believe we are discussing individuals who in reality have no place in the school system.

There are two permissible havens for the mental defective: one the public institution, the other the private home with a personal attendant for life. The only function of the school is to act as a temporary guardian, at the same time making a complete diagnosis by observation, Binet and other mental tests and as soon as possible securing institutional care for the defective. True it is, that all except the lowest mentalities can be taught something, but it is only parrot knowledge, of no value in making the individual safe and efficient in free competitive life.

The ungraded rooms to my mind should be a clearing house, a filter. Some of its product will go to the state institution, some to rooms for special instruction, and some even back to the regular school room. The very greatest caution must be used in this work.

Gentlemen, school inspection is but a part of the present great movement of interest in the growing child. It has grown in the past because of the support of the medical profession. I ask for the continued support of the entire profession in the continually widening field of work.

The great American child is a wonderful creation. He is worthy of the serious study of all of us, but most of all he is worthy of the complete co-operation between teacher, school hygienist, physician and parent.

THE USE OF MASSAGE AND EXERCISES IN THE TREATMENT OF FLAT-FOOT.*

HUGO AD. OLDENBORG,
CHICAGO.

The type of deformity of the foot, which we ordinarily range under the name of flat-foot (pes planus), is always associated with an outward rotation in the ankle joint (pes valgus), and the orthopedic men seem to agree that the best name, consequently, should be pes valgo-planus.

In order to lessen the shock to the body when, in the step, its weight is moved from one foot to the other, the foot is so constructed that the landing is made, not on a rigid surface, but on an elastic, springy one. There are three main points of support to carry up that weight; one

*Read before North Shore Branch, Chicago Medical Society, Feb. 6, 1917.

is the tuberosity of the os calcis, another is on the head of the first metatarsal bone and the third is on the head of the fifth metatarsal (although the heads of other metatarsals also share in the support).

If we connect these three points with straight lines we have the idea of the three aches in the foot (von Meyer's tripod), the outer arch, the inner arch and the transverse arch, which arches are maintained by means of a strong liagmentary apparatus as well as by muscles in the foot and the calf. In speaking of the ligaments, we may mention the following as being most active in maintaining the arches. The outer arch has as its main support the strong inferior calcaneo-cuboid ligament. The inner arch is sustained principally by the inferior calcaneo-scaphoid ligament which comes from the sustentaculum tali of the os calcis, and is attached to the under surface of the scaphoid bone. The space between these two bones is separated by the head of the astragalus, which rests upon this ligament. The transverse arch is kept up by a plantar ligament.

Concerning the muscles, we would like to quote John Dane:[1]

> Of the muscles, four are, from the peculiar arrangement of their tendons, of maximum importance in the maintenance of the arch of the foot. The tendon of the peroneus brevis muscle, having passed under the external malleolus, continues forward to be inserted into the base of the fifth metatarsal bone, thus spanning almost the entire external arch; the peroneus longus, keeping in company with the brevis in this course under the malleolus, passing over the external surface of the os calcis, winds around the outer border of the foot to enter the groove on the lower surface of the cuboid. From this it crosses the sole obliquely to its principal insertion on the posterior part of the first metatarsal bone. The outer and middle arches are both strengthened and bound together by this long tendon.
>
> On the inner side of the foot there is first the tendon of the tibialis posticus, which, after passing behind the internal malleolus, runs forward to be inserted into the scaphoid bone, in its course resting directly against the inferior calcaneo-scaphoid ligament, which in its turn bears against the head of the astragalus.
>
> The tendon of the long flexor of the big toe likewise turns around the internal malleolus. From this it passes in the groove under the sustentaculum tali of the os calcis, and runs forward in the sole of the foot to its insertion in the terminal phalanges of the great toe.

1. Boston Med. & Surg. Jour., Vol. 127, page 401, 1892.

To these we would like to add, first the flexor digitorum longus, which also passes behind the inner malleolus and beneath the other muscles of the foot, dividing its tendon in four parts, giving flexors to the four outer toes. In strongly flexing these toes this muscle together with the flexor hallucis longus will help to bend up the longitudinal arches.

We should neither forget the tibialis anticus which, going in front of the inner malleolus and on the inside of the foot, becomes attached to the under surface of the base of the first metatarsal bone, just in front of the insertion of the tibialis posticus on the scaphoid. This muscle together with the tibialis posticus, is the principal supinator of the foot, and just, therefore, so important in the prevention of valgus deformity.

A great number of the slowly developing skeletal deformities that we meet with are caused by a disproportion between the load and the power to carry this load, as for instance, scoliosis, knock-knee and flat-foot. We are apt to look upon these conditions as being caused by skeletal defects, not giving sufficient consideration to the importance of the support of the live power of the muscles. The disproportion between the load and the sustaining power may arise either from the circumstance that the weight is too great, or result from a condition in which the sustaining power to carry the normal weight has become reduced. The former is exemplified by the type of case that one not infrequently meets, namely, in a person of middle age, who begins to put on flesh and soon also experiences trouble with his feet. The latter type of case one will find in a person, who, after having overcome a serious constitutional illness, for instance, typhoid fever, has trouble with his feet when the normal weight of the body returns faster than the strength of the supporting muscles, and he, because of this condition, begins to experience pain in his feet. The load may again become too great for the sustaining power, even though the weight be not absolutely too large; for instance, if this weight is kept up for too long a time without rest or in an unfavorable position. Here we come into the question of flat-foot as a trade disease, and in this connection we also want to consider the importance of the nutritive condition of the muscles. The circulation in the legs is greatly aided by the alternating contraction and relaxation of its muscles. Therefore, walking is of great help to

the circulation of the lower limbs, while people, who for great lengths of time have to stand still on their feet are apt to suffer from disturbances of that circulation shown by the frequent presence of varicose veins. We also find that the same class of people are apt to suffer from flat-feet, for instance, chefs, waiters, barbers, and nurses, while letter-carriers, as a rule, do not complain of trouble with their feet.

By placing the foot in outward rotation, a position taken for the purpose of giving broader basis for support, there is an extra strain put on the ligaments going down from the inner malleolus, thus weakening the ankle and favoring the development of valgus position in that joint. This is the explanation of flat-foot troubles of apprentices in blacksmith shops, who are apt to take this unfavorable position in swinging the heavy sledge hammer. The fact that a great number of individuals being employed in these various trades do not sustain these troubles with their feet seems to bear out the fact, that we shall look for the principal etiological factor in their lessened ability to sustain the strain put upon the foot. Such lessened ability, we frequently meet with in the developmental period of the youth, for instance, those, who for one reason or another are anemic, are also apt to have trouble with their feet, a condition generally spoken of as "weak ankles." It may also depend on special affections of the bone structure, for instance, rachitis; as a deformity of this nature advances, the strain upon the sustaining powers also increases, so one would have reason to expect that the speed towards the full deformity should be augmented.

Nature has, however, provided certain resources which, if they do not tend to restore normal shape, help to hold back the progression. So, for instance, will the bone itself, after an affection like rachitis has ceased, develop new substances, which are arranged in such a manner as to sustain the change in the application of the load, produced by its deformity. It has furthermore been demonstrated that the muscles that help to maintain the arch will at least in the earlier stages of the disease show hypertropical development, evidently for the purpose of holding back the progression. When the disease has come to its full development the supporting power of the muscles has been conquered. Then one finds those on the flexor side in a state of atrophy, while the extensors, and especially the peronei are in a state of contraction. The ligaments have also done their part to hold back the progression, because one finds the plantar ligaments to be thicker, especially the calcaneo-scaphoid, while the dorsal ones are in a state of fatty degeneration. The whole foot then becomes rotated outward and in a state of dorsal flexion. The astragalus projects inward and downward, so that its head rests heavily upon the calcaneo-scaphoid ligament, while the tip of the external malleolus of the fibula is flattened out by its pressure against the os calcis, which bone is rolled over inwards.

In planning the treatment for the type of deformity that we call flat-foot, the question of etiology naturally becomes prominent. Hoffa[2] classifies the various types in:

(a) Congenital;
(b) Traumatic;
(c) Paralytic;
(d) Rachitic;
(e) Static.

The congenital flat-foot is treated by means of rotating manipulations and orthopedic apparatus.

The traumatic flat-foot is most commonly seen as a result after a Pott's fracture, when the patient begins to walk after having been kept off his feet for a more or less protracted time. While the fracture was held in immobilization there developed an atrophy of the supporting muscles, causing the patient's inability to maintain the arch when he began to walk. We believe it to be an important feature in the treatment of these fractures, to let the patient start the exercises of rotating his foot inward as soon as possible, and also to practice flexing his toes; this training to begin at least a week or ten days before he is allowed to put the full weight of his body on his foot. The muscles of his foot and calf then get an opportunity to recover their normal tonus and thereby their ability to carry up the arches when the full weight is put on them again. We believe that most teachers of surgery, nowadays, advise their students to dress these fractures with the foot in the position of supination with the view of helping to save the patient from having a flat-foot when he recovers from his injury.

In the paralytic flat-foot, which one meets with not so infrequently, particularly in connection with infantile paralysis, the training of the

2. Lehrbuch der Orthopädische Chirurgie, 1902.

muscles, which help to support the arches, is of course a very important feature in the treatment; and the degree of paralyzation will naturally decide whether these patients will need orthopedic apparatus besides the training and the manipulation.

In rachitis anyone can see that it would be foolish to treat the foot alone without giving the constitutional affection any attention. When the constitutional disease is overcome, the treatment will have to be decided according to the deformity then existing.

The majority of the cases of flat-foot that one encounters will, of course, be classed under the so-called static form. If the condition be acute, such patients should be taken off their feet until the soreness has disappeared. Here, one often meets with a serious economic question, however. The patient's financial condition may demand that he does not stay away from work, and the physician may also have difficulty to impress upon the patient that his point in trying to keep him off his feet is an important one. If the circumstances do not permit the patient to take a horizontal position, and free himself from the irritation of tight-fitting shoes, he should at least take the weight off his feet by using crutches until the soreness has gone away. During this time the tender areas about the plantar surface of the foot should be manipulated daily by deep massage. Massage of the muscles of the leg for the purpose of relaxing those that are spastically contracted, accomplished by means of light strokings, and stimulating those that are weak, by more vigorous manipulations and tapotement. As we generally find the foot stiff and unelastic, we should use manipulations which tend to loosen the joints as well as such passive movements as aim to redress it into normal shape again. Gradually, as the tenderness disappears, we begin with the exercises. These consist of inward rotation of the foot, first without and afterward with resistance, and strong flexion of the toes; to begin with, alone, later on in combination with the inward rotation.

The patient is by and by allowed to put his foot on the ground and as the disappearance of the soreness permits, made to walk for short periods of time. When his strength increases he is told to walk on the outer edges of his feet, raise up on his toes and walk on his toes while he tries to create a varus position in his ankle. He is also made to strongly contract the flexors of his toes in the step. The massage should be made in such a manner as to give the patient a feeling of comfort in his foot and the exercises should not be kept up so long each time as to lead to fatigue. When the patient has learned how to practice them himself he should be told to repeat them frequently, but not too long at a time.

In the advanced stages of flat-foot, we do not believe one can give much hope for cure. Orthopedic supporting apparatus may give some relief. Here, attention may be called to the fact that the orthopedic apparatus never does cure the condition, only supports the arch. The cure, when such can be brought about, is accomplished by means of the exercises. This relation between the two forms of treatment does not seem to be sufficiently appreciated. They should be used together and not to substitute for each other.

Finally one often meets with patients who suffer from pains in the feet and legs which are of purely muscular nature and have their origin in some focus of infection, perhaps in the nose, throat or teeth. When the focus is cleaned out the trouble with the feet generally also disappears.

122 South Michigan Ave.

AMAUROTIC FAMILY IDIOCY. (TAY'S-SACHS' DISEASE.)*

EDWARD F. LEONARD, M. D.,
CHICAGO.
Assistant Professor in Neurology, School of Medicine, University of Illinois; formerly Assistant Physician, Jacksonville State Hospital.

CASE HISTORIES.

Case I.—Male, 17 months old, Hebrew, second child. Patient first seen June 27, 1916. The first child of these parents is a boy 6½ years old and appears healthy, physically and mentally. The father is 32 years of age, the mother 27 years of age, not related and first marriage. Father born in Austria, mother in Russia. Family history negative. No nervous or mental trouble traceable. No drugs or alcohol used on either side.

Pregnancy: Mother well during pregnancy. Child born at full term, forceps, weighed 8½ pounds, no fever. Nursed child up to four months; then milk gave out and changed to bottle.

Personal History: There was no distinct nor definite disease up to ten months, when the patient had a

*Read before the West Side Branch of the Chicago Medical Society, January, 1917.

severe bronchitis that lasted ten days, coughing a great deal. The child became thin and lost in weight. Legs and arms became weak and he had difficulty in drawing up the legs; he could neither hold head up nor sit up. The mother believes that at six months the child acted like other babies of that age; would laugh if tickled, but did not do so during my examination. Mother thought child could see before illness, as he would try to grasp at things and would play with a rattle. At time of examination would not grasp at rattle of own accord, but would take hold of one if put into his hands. After illness he became yellow, and moaned and fretted a great deal, and the slightest sound caused him to jerk.

Before illness the bowels and kidneys appeared normal; after illness child suffered with constipation. No trouble at teething, and no convulsions. Child never made any attempt to crawl.

Examination showed a poorly nourished child; circumference of head 19 inches; anterior fontanelle open. The head was thrown back and supported by the mother's hand. The pupils reacted to light, and patient would turn head toward the direction of a sound.

Knee, biceps, triceps reflexes increased. Babinski and Oppenheim present on both sides. Arms and legs were spastic. Child died October 31, 1916, of bronchopneumonia.

Case 2. Female, aged 15 months, first and only child, Hebrew; father born in Germany, mother born in Russia. Child at birth appeared normal, was examined by writer July 19, 1916, father reporting at that time that patient had not been well since it was seven months old. At time of birth forceps were used, mother being in labor for 18 hours. Child breast-fed for eleven months; first tooth cut at the age of nine or ten months. The father stated that the child seemed normal when two months old; when it was seven months old, a picture was taken, at which time it was noticed that something was wrong, for at the photographer's it would not pay any attention to the toys used to attract its attention. During the fifth or sixth month, however, the patient observed light, but the parents at that time noticed that the child could not hold her head up; up to that time she could not sit up, in fact never did. The child took liquid foods, but no solids; did not suffer from any of the diseases of childhood. The limbs seemed weak and the child was restless.

The father and mother are both living. The father had a struggle to secure an education, and since marriage, more or less of a struggle to earn a livelihood. The grandparents on both sides are nervous.

Examination: The child seemed well nourished, but pale. Head 19½ inches in circumference and anterior fontanelle open. Eyes would move from side to side when child was tickled. At times the child seemed able to follow a pocket-light. There was some strabismus. The child did not follow examiner's finger when placed in front of eyes. When finger was raised the eyes looked upward.

The head, trunk and extremity muscles were weak. At times limbs would straighten out and child become rigid. The head fell back, and child could not lift it, and it felt like a weight on one's arm. There was moisture of the hair of the scalp. The deep reflexes were increased. The least noise caused the child to suddenly jerk. Very often during the examination there was a moaning cry from the patient.

During the early part of October, 1916, the child developed a gastro-enteritis, and two weeks later a number of epileptoid convulsions came on. Last saw the patient on October 31, after a series of convulsions.

From the history, general appearance and examination of the patients, a provisional diagnosis of amaurotic family idiocy with hydrocephalus was made, and patients referred to Dr. G. F. Suker, Chicago, for eye ground examination. He reported that the eye findings were typical of Tay's-Sachs' disease.

DESCRIPTION OF THE DISEASE.

Definition. Reviewing the literature one finds that this is a rare disease, occurring in family groups, characterized by the gradual onset of blindness and a dark red spot in place of macula lutea, with mental and physical impairment, and ending invariably in death.

Historical. On account of the eye trouble Warren Tay of London, in 1881, was the first to describe a peculiar disease of the cerebro-spinal system occurring exclusively in childhood. He called attention to the affection in a child of twelve months. In the same family three similar cases occurred.

Sachs, after extensive study of the affection, described his first case in 1887, not knowing that Tay and Kingdon had previously published theirs. Sachs collected 27 cases in the literature, his own being included in the number. Kaplan published two cases, and has since seen six others. Cases and studies of the disease have been reported by Claiborne, Patrick, Kuh, Jacobi, Hirsch, Peterson, Cotton, Hirschberg, Frey, Beard, Collier, Carter, Falkenheim, Holmes, Poynton, Apert, Haverach and others. Holden, Mohr, Treacher, Collins, Schumway, and Buchanan have examined the eyes postmortem. F. W. Mott[1] gives the microscopic and chemical changes in central nervous system, of two cases of this disease.

Etiology. Different views are held concerning the probability of a congenital or an acquired origin of the disease. Four theories have been advanced to account for it:

1. Cortical agenesis (Sachs).

1. Mott, F. W.: Arch. of Neurology, iii, 218.

2. Primary cortical degeneration (Russell and Kingdon).

3. A toxic degeneration of the motor neurones (Hirsch). He is inclined to regard amaurotic idiocy as a form of infection originating in the intestinal canal.

4. Degeneration resulting from an inherent bio-chemical property of the protoplasm of the nerve cells (Holmes).

Coriat believes that on account of the normal characteristics up to the ages of 4 and 10 months, that the disease is not really an idiocy, but is a form of dementia, as the macroscopic and microscopic changes are not those of idiocy, and he suggests the name "Amaurotic family dementia."

Mettler believes it is a fundamental development defect, one in which the newly-coined word of Gowers', "abiotrophy" could be applied.

Mott says: "The fact that it affects children of Jewish parents, suggests that it owes its origin to some racial inborn tendency to neuronic decay, probably associated with some exciting or predisposing factor connected with an altered condition in the chemical composition of the blood, whereby the normal bio-chemical interactions of the nucleus on the cytoplasm and environmental lymph of the neuron is interfered with." Most authors, however, are disposed to believe it is due to some congenital defect.

Familial statistics show that the disease is usually present in several members of the family, and seems to be distinctly hereditary. Sachs reports 17 cases occurring in 6 families. Ireland, in a report of 27 recorded cases, states that eighteen occurred in twelve families. As many as four cases have been observed in a single family, as shown by Tay's cases. Peterson reported three members of one family afflicted with it. Apert in 1908 collected 82 cases, with 27 additional cases occurring in relatives of the 82. Several healthy children have been born to parents who have had one or two children afflicted with this disease.

Age. It commences during the first year of life. At any time between the fourth and tenth month, a normal infant, born at term, will more or less suddenly cease to grow, physically and mentally.

Race. All the recorded cases have occurred in the offspring of Jewish parents, except one case reported by Turner.[2] Speilmeyer, Higier, Vogt, Dercum, and others, have described as a juvenile form of the same disease, a condition with many similar symptoms. It sets in between the ages of 8 and 12, and occurs in other than Hebrew families. It has a more chronic course, and there are no changes in the macular region.

Syphilis. Absence of syphilis has been distinctly noted in most of the histories, and it does not appear to have any relation to congenital syphilis; although Dr. Geo. E. Price,[3] of Philadelphia reports a positive Wassermann reaction on blood-serum in a case of a Hebrew boy aged sixteen months.

Maternal trauma. Injury to the mother during pregnancy has been reported in several instances.

Pathology. Uniform degenerative changes in ganglion cells of the gray matter throughout the whole nervous system; the ganglion cells were increased in size, containing a globular nucleus; the cell membrane and cyto reticulum were intact, but the Nissl bodies had entirely disappeared. There was a destruction and breaking off of the dendrites and axis-cylinders. The cerebral convolutions were of a primitive type; microgyri, an absence of the tangential fibres, and a decrease of fibres of the white matter.

The medulla, corpora quadrigemina, geniculate bodies, 3d or 4th cranial nuclei, and the cells and fibres of the optic tract showed degenerative changes. There is also a degeneration of the ganglion cells of the retina. Changes have been found in the pyramidal tract. The blood vessels were found normal. Mott found in his two cases that the posterior spinal ganglion cells, and the sympathetic ganglion cells showed disappearance of Nissl substance. He says: "It is therefore probable that every nerve cell in the body is thus affected more or less." He believes that the essential feature is a failure in the elaboration of the nucleo-proteids of the neurons as evidenced histologically by the disappearance of Nissl granules.

F. Peterson found change in the suprarenal glands. McKee found changes in the thymus gland; Gordon found enlargement of the thyroid.

Ocular changes. The appearance of the optic disc is pathognomonic in the disease. Fay, Wadsworth, Carter, Beard, Westcott and others have studied and described it. The change in and

2. Turner: Brit. Jour. Child. Dis., 1912.

3. Price, Geo. E.: J. A. M. A., May 15, 1914.

around the macula lutea is the important diagnostic sign. Beard describes it as follows: "Surrounding the fovea centralis, concentric with it, and two or three times its size, is a liver-colored disc. The disc is the center of a zone of grayish-white which gradually fades away into the normal red-orange of the eye ground. As clear cut as a coin is this livid disc. It is not irregular in outline as is the case in acute inflammatory conditions, where the surrounding retina is infiltrated, nor is it cherry-red or carmine, as in those cases, but it is distinctly brownish. It is larger than the fovea; that is to say, instead of marking the area which is occupied by the cones alone, it marks that which is devoid of the ganglion cells. The whitish zone that surrounds the center is also highly characteristic. It is nebulous rather than cloudy. It is almost white at the circumference of the liver-colored disc, thence gradually thins away to nothing, but is translucent and exhibits *some* color throughout. It does not obscure the retinal vessels which enter it. It only serves to make them more distinct by contrast, so that one is able to trace the tiniest of them right up to the central spot."

Symptons. A child born normal and healthy seems to all appearance to be getting along nicely until about the fourth or eighth month, when it is noticed there is some weakness of the muscles of the neck, which leads to an inability to hold the head erect. (It appears top-heavy.) This weakness gradually extends to the trunk and limbs. The little patient can no longer hold up its head, sit erect or grasp anything. The paralysis at first is flaccid, later changes to one of spasticity with atrophy. The reflexes are either normal, a trifle subnormal, or exaggerated, according to the stage of the disease. The functions of the body are below normal, and marked pallor supervenes. Early, and associated with this general weakness, there is a gradual recession of its previous mentality, the first signs being simply a dullness, a loss of interest in objects or playthings which before attracted its attention; it does not seem to notice mother or nurse, and cares less and less for play. Associated early with the physical and mental weakness there is a disturbance of vision, and this may partly account for the child's early lack of interest. Rapidly the child becomes blind. Periodical convulsions are present in some cases.

Strabismus, nystagmus and irregularities of the pupils and dysphagia further show involvement of the muscular system. In some cases the head is enlarged and the fontanelles still open. The pulse is often rapid. Bronchial attacks and gastro-intestinal disturbances are frequently present. In some cases there is increased sensitiveness to touch and sound and the slightest noise in the room startles the child. Frequently, jerky movements of the limbs are noticed.

Prognosis. The malady runs a course of about two years, and invariably terminates fatally, marasmus, pneumonia or convulsions causing death. Of the twenty-seven cases of Sachs, only one lived to the age of six years. Sachs sums up the chief symptoms as follows:

1. Mental impairment observed during the first months of life and leading to absolute idiocy.

2. Paresis or paralysis of the greater part of the body, and this paralysis may be either flaccid or spastic.

3. Reflexes may be normal, deficient or increased.

4. A diminution of vision terminating in absolute blindness.

5. Marasmus and a fatal termination, as a rule, before the age of two years.

6. Occurrence of the affection in several members of the same family.

Treatment. The treatment is symptomatic. Some authors, believing the disease is due to a toxemia, or that the maternal milk is deficient in those agents which are of primary importance in the development, physical and mental, of the child, recommend removing the child from the breast, and the child given fresh-drawn cow's or goat's milk. Most of the cases have been breast-fed. It has also been suggested to try small doses of adrenal gland, thymus, thyroid, or pituitrin.

It has also been suggested that in any future cases a careful chemical examination be made of the mother's milk.

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THE TREATMENT OF TABETIC ATAXIA BY RE-EDUCATIONAL EXERCISES*

LEWIS J. POLLOCK, M. D.,
Instructor in Nervous and Mental Diseases, Northwestern University Medical School.
CHICAGO

Ataxia is so prominent in the symptomatology of tabes dorsalis that it is employed in the formation of the clinical terminology of this disease. Unlike many of the symptoms it is not amenable to medical treatment, nor it is influenced by any of the measures recently adopted for their curative value. Pain and gastric crises may disappear, the serological picture may become normal and the disease may apparently become arrested as the result of proper spirochaeticidal therapy, but the severity of the most disabling symptom, ataxia, remains unabated. That so important a feature of this disease should receive so little attention from the medical profession is little short of remarkable. Although reeducation and compensatory exercises have been described for a number of years and in spite of the benefit derived as the result of the employment of these methods, the literature is comparatively barren on these subjects and the administration of the treatment half-hearted and desultory. Inasmuch as ataxia is due to a pathological deviation of physiological movements it will be of some value to review very briefly the subjects of co-ordination and ataxia. The term "Co-ordination" denotes the united action of a group of muscles in order to carry out an intended movement. In order that a movement may be co-ordinated it is necessary that a certain number of muscles should enter into action in a definite grouping and succession and with a regulated distribution of strength. Every movement which has a determined object sets a number of muscles into action. Not only are the chief agonists or the muscles whose contraction brings about the intended movement, but also the synergist and antagonists brought into play. The newly born babe does not make any co-ordinate movements. In it the chief movements consist of those producing crying, sucking and swallowing. Actual co-ordinate movements must be acquired. Little children when attempting to walk or catch a ball or eat with a spoon make movements which are not co-ordinate but which are not strictly speaking ataxic. This same disability is observed in adults when they attempt any unaccustomed movement, as playing the piano, skating, etc. At first the movements are not at all adapted to the performance of the desired purpose and become skilled only after long continued and persistent repetition.

When the regulated correlation of movements is disturbed ataxia ensues and is demonstrated by the fact that the movements are not carried out so that they reach their object by the shortest way, or with the requisite amount of force, or with the employment of the smallest number of muscles possible. This ataxia may be brought about pathologically in a number of ways. It may be present as the result of cerebellar and adnexal lesions where it is due to the injury to the main center of co-ordination. Careful analysis of the laws that govern co-ordination shows that uninterrupted reception of sensations from our surroundings and tendon, muscle and other deep sensations acquainting us with the position of our extremities is an integral and indispensable part of the mechanism of co-ordination. A defect in these functions therefore results in an ataxia which is called sensory and which is the type found in tabes dorsalis. The patient suffering with tabes dorsalis is ataxic because he can no longer feel the position of his extremities, in fact he loses them, can no longer tell how far a muscle has contracted and how forcefully it has acted, or how rapidly it has moved. He attempts to compensate for this loss by employing his eyes to supply for him the information his sensory functions deny him. It need not be recalled to you that one of the classical signs of tabes, Romberg's sign, is based upon this very fact. As in the ataxia of tabes so in the clumsy movements of normal individuals performing unaccustomed acts, removal of the assistance of vision decreases the disability. The disability in tabes is not dependent upon the ataxia alone. There is for instance the muscular hypotonia and the flaccidity and relaxation of the capsules and ligaments of joints permitting hyperextension and causing flail joints.

The degree of ataxia and the amount of disability varies in the same patient according to certain circumstances, whether he walks alone or with someone to support him, whether the room is well illuminated, whether the floor is carpeted or polished, whether there is near at hand a piece of furniture that he might grasp if he fall, whether he is walking in a room or upon the

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street. Upon such entirely external conditions depends the type of gait, either the care-free cock stride or the short fearsome walk. These very facts prove that the tabetic has not lost the faculty of adapting his movements, however imperfectly, to the occasion. It is an interesting and important observation that tabetics have forgotten how to perform certain movements, as in arising from a chair they forget to bring their legs back first, or in walking they forget to shift their balance from one to the other foot.

One of the characteristic faculties of the nervous system is its teachability. To be learned, an episode or movement, etc., must be clearly apperceived, closely attended to and frequently repeated.

Upon this premise are based the various methods of the re-educational treatment of tabetic ataxia. Such methods have been employed by Leyden, Goldscheider, Raymond, etc. The greatest impetus in this direction, however, was afforded by the development of a very exhaustive method by Frenkel (Heiden). Later in this country a slight deviation was described by Malone. Of course, to be teachable some sensory fibres must be intact, and many fibres are usually intact in tabes. Upon what does the success of these methods rest?

It is related by Frenkel that a now famous professor, in preparing his maiden lecture, selected a certain number of tabetics for the purpose of demonstration and inadvertently instructed them as to what movement each one was to perform; they in their eagerness to please practiced these several movements so assiduously that to the professor's chagrin they performed them with the precision of perfectly normal individuals. Thus it is seen that Frenkel's treatment is based upon the education of the nervous system. But another factor must be considered. It is a notorious fact that tabetic patients are very suggestible; when they present themselves they usually are in the troughs of despondency; they have been told that their condition is incurable and they have become resigned to their fate of an effortless existence of deterioration. It is not at all unusual to find a patient who has but little sensory loss and an enormous disability which is the result of discouragement, fear and lack of confidence. That this is the case is demonstrated by the fact that tabetic patients improve clinically after any new treatment, and that a very much more marked improvement occurs early in the institution of the Frenkel treatment than later. This in no sense minimizes the usefulness of a method. If we can instill hope and stimulate energy and spirit in men who have for years been confined to wheel chair or who have not walked unattended and can keep them so stimulated, then the method answers therapeutic principles very well. Fortunately this method offers even greater results. Attention of the American physicians was first called to Frenkel's treatment in 1897 by Dr. Boerne Bettman, then Professor of Ophthalmology in the College of Physicians and Surgeons, Chicago. Founded on the basis of normal movements and locomotion, Frenkel has devised a system of exercises. These exercises are notable because of the emphasis laid upon the frequent repetition of these movements and the stress put upon the necessity for precision and careful attention. They are in no sense gymnastic and such exercises are to be discouraged. It the patient performs the movements slovenly they are of no service. It is far more important to perform one movement well than a dozen carelessly. Or, it is better to do nothing and do that well. The exercises are indicated in all cases of tabes even in the pre-ataxic state. Certain conditions must be considered in prescribing the treatment. Blindness coupled with severe ataxia offers poor prospects of recovery. Hypotonia of severe grade must be attended to by orthopedic measures; it is far better to be a tabetic walking with crutches than a trained tabetic with a fractured leg. In heart disease the patients must be closely watched, as the sense of fatigue is lost. Spinal irritation is a contraindication, but gastric crisis and lancinating pains are not. The exercise should be followed twice a day, but no more. The entire exercise time should not exceed thirty minutes and no more than three minutes should be devoted to each exercise.

All tabetics suffer a marked loss of the sense of fatigue and because of this the exercises must be closely observed and the pulse of the patient frequently taken and if any marked rise occurs the seance must be interrupted. Between each exercise period a rest must ensue. Constant attention must be exercised, as many accidents may occur, as the turning of an ankle, collapse of the hypotonic knees. If the patient is very ataxic, then he must be supported by attendants with the aid of a belt. The following groups may be distinguished:

1. The patient is able to walk without support.

2. He has to lean upon the arm of a companion with or without a stick.

3. Walking is impossible, but the patient can stand.

4. Walking and standing is impossible.

The exercises are divided into those for the upper and the lower extremities. There are groups for the reclining posture and for walking; those for the reclining position should be performed in the morning, and the walking exercises in the afternoon. For some of the exercises special apparatus is required, and for others diagrams upon the floor. As a matter of fact one need have no apparatus at all. The best place to exercise in the recumbent position is the floor, over which heavy dull oilcloth or canvas has been placed.

It is needless to detail the various exercises which may be found in Frenkel's book. Those to be followed in the recumbent position consist of various combinations of the ordinary movements of the lower extremities, flexion, extension, abduction, adduction, internal and external rotation.

I have found it very serviceable to tie a bandage to the ankles of very ataxic patients and have them hold the ends in their hands as reins, guiding the ataxic extremity until it is able to perform the movement alone. Any exercise which employs the muscles subserving the above mentioned movements are proper and sufficient and one need not at all be bound to any system, provided that the fundamental tenets of Frenkel be adhered to.

First, it is necessary to study the patient and select the muscles requiring reeducation and then outline a set of exercises suitable for them. These exercises must be followed tenaciously, persistently, accurately, and most of all, slowly. Tabetics are always in a hurry just as is a normal man crossing a stream over a narrow plank. Each exercise must be well learned before any new set is presented; the patient must direct particular attention to the attempt of learning what each movement feels like, so that later the movements may be performed without the assistance of vision. The recumbent exercises bear a similar relation to the walking ones that Delaney's land exercises bear to swimming. Preliminary to the actual walking exercises, it will be found serviceable to first teach the patient how to get up on his toes and how to shift his balance from one foot to the other foot. This is easily done by having the patient stand in a doorway supporting himself by the door jambs and first learn how to stand without having his center of gravity too far back, which is a common fault with tabetics, then to stand upon the toes of one, then the other foot, then to stand back and after rising upon the toes of one foot to advance the other and fall forward upon it. The use of two heavy rubber tipped canes should be insisted upon in the first walking lessons whether necessary or not, because then one can more easily obtain certain movements which I have found more or less requisite to the reeducation of walking. Almost invariably the ataxic patient uses the cane as a symbol or fetich, and that only. I mean that it is unusual to see a patient lean forward upon the canes for support as does a normal person. The ordinary thing is to find the cane going to the front and the patient to the rear. It is a hard thing to teach the patient that by leaning forward the canes will support him and falling become impossible.

It is a good thing to teach them a sort of a modified military stride in which the essential steps are the following: Up on toes, shift balance to right, fall forward on left; up on toes, shift balance to left, fall forward on right. This set up, so to speak, should be continued for a long time after the patient is able to walk well without it, and having insisted upon its use so long the patient will continue to use it, and as a result never forgets to shift his balance, never becomes confused, and always possesses the best possible station. Of course it goes without saying that these steps must always be of a proper length and may be regulated by the painted stripe into quarter, half, or full steps; they must be contained within the limits of the stripe, whether narrow or broad.

Two conditions are frequently encountered which retard progress; one is ataxia of the upper extremity which prevents the use of canes until it is cured by exercises. The other is a more serious disability; namely, ataxia of the trunk. It is frequently mistaken for ataxia of the legs and if not recognized and proper trunk exercises employed, the results will be disappointing. Such errors are common and contribute to some of the apparent failures of this method. On the other hand, some years ago I saw walking across the floor of the New York Academy of Medicine, to the tune of an acclamation such as is usually reserved for Teddy, a woman purported to be cured of a severe ataxia of tabes by the Frenkel

method. This woman had had an attack of peripheral neuritis and would have been cured if she had tied a red string about her ankles.

A methodical and precise method for turning about must be taught to these patients, as frequently during this procedure they experience their greatest disability. The exercise for the upper extremities, for which the same general principles hold good, are performed with the assistance of drawing boards, checkers, peg boards suspended colored balls, etc., and need not be further described.

I have treated by this method about twenty patients; most of these were treated in the Cook County institutions, where for a period of ten months they conscientiously performed these movements twice daily for a period of thirty minutes each. The majority of these patients could walk without the assistance of attendants, but with the aid of either one or two canes or crutches. The others could be divided into the remaining three groups of Frenkel.

Certain conclusions may be drawn from the observation of this group of cases. In no case did the ataxia remain unimproved. In all the ambulatory cases the improvement was marked. All cases formerly walking with one cane were able to do without it. Cases using two canes in some instances were able to dispense with one; in others, with both. Cases walking with crutches were able to walk with the aid of a cane. Two cases showed practically a complete functional recovery, one at first unable or unwilling to walk outside the confines of the ward, became the grocer's boy for a store opposite the institution. The other now runs a chicken farm. All the ambulatory cases regained so much hope, energy, and confidence that they were able to utilize to the fullest their remaining functions. The cases which were either unable to stand or could walk only with the aid of attendants showed only so much improvement that they were able to attend to themselves much easier in eating, changing their position in bed, or attending to the calls of nature. In no instance was there any untoward result. In fact, the lancinating pains seemed to be less frequent.

A few questions may serve to clarify the situation. Is it practicable? It certainly is. No apparatus is necessary, the method is neither difficult nor complicated, and the patient may after a period of tutelage under the physician continue the exercises himself. Is it successful? Nothing can answer this question as well as the fact that upon a visit to the institution three years after I had been in charge I found some of the patients practising the exercises on their own hook. Is this a cure? It is not. And although many brilliant results have been obtained and many patients have been greatly benefited, too much must not be expected of this method and too much must not be promised. To what may the failures be attributed? First, to the improper selection of exercises, carlessness, and to insufficiently continued movements. Second, to the too great destruction of sensory tracts and, third, to permitting patients to become unduly fatigued, which destroys more function than any method can produce.

What is the comparative value of those methods which employ only exercises without the aid of vision, and those employing vision? I have had experience only with the latter method where exercises without the assistance of vision are employed only after they have been mastered with its aid, and I can see no reason to employ another method.

25 East Washington Street.

A MODERN HOSPITAL FOR THE INSANE FROM THE STANDPOINT OF MEDICAL SERVICE*

Research and Educational Work

H. Douglas Singer, M. D., M. R. C. P.
Director Illinois State Psychopathic Institute.
Kankakee, Illinois

The modern hospital for the insane is a quite peculiar, composite institution dealing with the most widely varying kinds of disorder. At the one extreme it approaches the ordinary general hospital with patients suffering from various acute and chronic diseases, whereas at the other it approximates and even overlaps the reformatory and the penitentiary. The one factor common to this heterogeneous mixture is some disorder of conduct and behavior which renders those thus afflicted incapable of ordinary social life. Primarily, the motive for the segregation of these individuals was purely a selfish one, the protection of society from damage. The fate of those thus incarcerated claimed and received but little interest or attention so long as they were not allowed to escape. As civilization has progressed

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it has come to be recognized that many such individuals require protection from themselves and from the world. With this humanitarian conception there has necessarily been a growing interest in conditions within the asylum and a corresponding improvement in the methods of care.

Within quite recent times we have begun to realize that the conditions included under the caption of insanity are worthy of study; that some are capable of recovery or prevention and that the magnitude of the problems concerned renders them of immense economic as well as humanitarian importance. This is well indicated by the widespread tendency to substitute the name hospital for that of asylum. This can mean nothing if it does not imply the application of hospital methods of study and research. We may therefor take it for granted that the need for facilities for research is fully appreciated and I may confine myself to the effort to indicate the character and variety of the problems to be faced and worthy of consideration in the planning and organization of such a hospital.

These problems may be broadly grouped for discussion under the following headings:

Care.

Treatment.

Prophylaxis and after-care.

It has already been pointed out that the problem as to how most safely and economically to care for these persons was for long practically the sole one. This was the natural outcome of the general impression that the insane were not capable of recovery. Consequently these institutions have been regarded as concerned purely with housekeeping details and this attitude is still far too prevalent even in official quarters. Yet, even with a knowledge of the real facts, it is true that, hospitalize as we may, the problem of care is still a highly important matter. Many of the inmates are doomed to a life-long residence in an institution and there is yet much to be done to make the conditions of such existence satisfactory. Even the most optimistic administrator will not venture to claim that the last word has been said even upon such simple and everyday matters as the best methods of housing, feeding, clothing and supervising such patients. The long list of papers in this symposium dealing with these questions is sufficient demonstration of the fact that there is still much to be learned and that these are legitimate topics for research and earnest consideration. Since they have already been widely dealt with I shall pass them over without more comment. But permit me to indicate one direction in which research is especially needed and which requires proper equipment and qualified investigators. I refer to the employment and occupation of patients. This has its economic side but is of far more importance as a means of care for the patient. Occupational diagnosis will come to play a gradually increasing part in our social system at large, both for efficiency and economy. The methods for reaching reliable conclusions are still to be worked out, but there can be no doubt that it will prove a large factor not only in successful administration of the hospital, but also in the more important field of prophylaxis. Research along this line has only started and we are still in the stage of trial and error. Correlation of the results of such trials with the findings from detailed studies of the make-up and personality of the individual are still to be made. This means well-equipped and diversified industrial departments with facilities for education with careful observations and records. I am firmly convinced that there exist greater prospects of improvement in general welfare and upkeep, as well as economy in management, in this direction than in any other.

The problem of treatment may be considered under two categories. First is that which aims directly at the cause of the disorder and, second, that which is purely symptomatic. It is a great mistake to assume that the latter is merely temporizing and of no importance. All treatment is merely an adjuvant to the natural reactions of the body which must, in every instance be the real curative agency. Symptoms, properly understood, represent these reactions and are hence efforts towards the removal or neutralization of the cause. Yet, though more or less well adapted to deal with the disease or difficulty present, they may nevertheless do harm by interfering with other functions. Emotion, for instance, is a reaction of the body more or less adequately designed to meet conditions of the body and environment. But emotion implies an enormous upset in the general functioning of the body, changes in the pressure and distribution of the blood, interruption of digestion, etc., which may of themselves, if sufficiently severe and prolonged, cause the death of the patient. Fever undoubtedly is an important means of defense but may be so intense as to destroy the body it is defending. Hence symptom control is one of the most im-

portant duties of the physician and a study of symptomatology and symptomatic remedies of vital necessity.

Yet obviously measures directed towards the eradication of the *causa morbi* are the fundamental purpose of our treatment, for in this way we are enabled to permit and intelligently assist the symptoms to achieve the results for which they are designed. Upon this determination of the cause must also depend our ability to prevent disease which is the principal object of medicine today. While then not neglecting the study of symptoms and the effects which they produce we reach the really fundamental problem when we turn to consider etiology and pathogenesis.

Let me first point out that the problem of causation is an extremely complicated one requiring all kinds of investigation, and it is a mistake to think that the answer is to be found of necessity in the laboratory. The objective fact in all cases of so-called insanity is disorder of conduct in relation with social conditions as they are. In other words there is some disturbance in the adaptation of the effector organs of the body to the environment. Hence one must realize that the error does not necessarily lie in the muscles and glands of the body or even in the brain, which serves as the means of co-ordinating these organs with the conditions of the environment but may lie outside of the body altogether.

A simile may perhaps make this more clear. An automobile consists of a number of individual parts, each of which has a certain function to perform. These parts are so connected that, like the body deprived of the brain, they carry on a co-ordinated activity automatically within certain limits. But the automobile is required to maintain relations with a widely varying environment. The connecting link between that environment and the working parts of the machine is the driver who is able to control the various parts, and thus produce purposeful adjustments of the machine to conditions as they arise. Every now and then the machine under the control of its driver will commit, what may be described as an unsocial act, in the sense that it conflicts with the requirements of social organization. For instance it may kill a pedestrian. This may come about in various ways. First, it may be due to some defect in the machinery such as poorly constructed steel which by breaking destroys the steering apparatus. Or the error may lie in the driver who is perhaps intoxicated. Again it may be in the pedestrian who perhaps has a fit and falls in front of the machine. But it must also be realized that the accident may happen without any material deficiency in the machine, the driver or the pedestrian. Such would be the case if either the driver or the pedestrian were untrained or wrongly instructed. Hence in order to determine the cause of the unsocial act it would not suffice merely to study the parts of the machine or even the condition of the driver; one must also investigate the pedestrian who here represents the environment.

In just the same way, to arrive at a conclusion as to the meaning of the social maladaptation which is called insanity, it is necessary to investigate the body organs of the patient, the mechanisms which adapt the functions of these organs to the conditions of the environment, that is to say his brain in action or mind, and the environment itself. Furthermore we have no right to conclude that, because we find certain deviations from the usual in any one of these spheres, we have therefore the whole facts. There may well be a combination of factors and some of the pathological findings may even be the result of the disorder instead of the cause. In his effort to avert the accident the driver of the automobile may do something which results in damage to parts of the car and we might reach an entirely erroneous conclusion that this damage had caused the accident. It may, it is true, have been a contributory factor in the sense that if the part in question had stood the strain placed upon it the method of meeting the situation adopted by the driver might have been successful in its purpose.

The hospital, then, must provide for the following classes of investigation:

The study of the bodily organs.

The study of the personality, the biologic psychology or habits of adjustment.

The study of the environment.

The great criticism which can be made of most of the work so far done is that it has been too one-sided, paying attention more or less exclusively to some one or other of these phases and perhaps to some one point. We cannot hope to obtain conclusions of real etiological value unless the material is studied from every point of view and the results considered as a whole. This means teamwork of a high order upon the part of the medical staff and there is room for men with spe-

cial interests in all directions. It also means a staff of considerably greater magnitude than that usually provided.

The study of the patient implies the provision of all known means of physical diagnosis, with properly equipped laboratories for clinical investigations of all kinds, serological, bacteriological, chemical and psychological. With these must be correlated the findings by histological methods upon material removed for the purpose or obtained postmortem. In estimating the value of the findings in any one of these departments it must never be forgotten that disorder of function and finally even structural change may be the result of social maladaptation or the effect of some intercurrent and unrelated disease process instead of the cause of the so-called insanity.

The investigations so far considered represent a study of the tools with which the patient has to work in the struggle for existence of himself and his race. We next come to the question as to how he uses them, his personality. For this purpose we have first the opportunity to observe his reactions to conditions which are subject to our control, that is to say his manner of meeting the situations in which we may place him, by question and otherwise, inside the hospital. This makes up a large part of what is called the mental examination of the patient. Unfortunately, it too often tends to degenerate into a mere routine and the purpose becomes reduced to an effort to tag a name onto the type of reaction. What is really needed is a detailed record of the adjustments which the patient makes under situations purposely planned for the investigation of this individual case. Obviously it must always contain an exact description of the situation as well as of the reaction. When thus carried out there becomes possible an analysis of the material and a more or less clear conception of the make-up and habits of adjustment of this patient at the time of the mental disorder. Such a description, when allotted a name, is often spoken of as a *diagnosis* of the insanity, but it really represents nothing more than the characterization of the mode of reaction. To this must be added the information as to methods of adjustment which were habitual to the patient throughout his life prior to admission to the hospital, obtained from every available source. At the same time there would be secured a story of the conditions under which the patient has lived, the heredity and the character of the persons with whom he has been associated, upon whose training and example must depend much of the patient's personality. In so doing we are also fulfilling the requirements of the third factor mentioned above, the study of the environment.

The means whereby this information is to be obtained is an extremely important topic for consideration. Experience has shown that if we trust to the chance visits of friends and relatives we shall rarely succeed in achieving the desired result. Information obtained by means of letters and formal interrogatories is almost worthless because of the impossibility of cross-examination. Hence some other method is absolutely necessary and a department for the collection of information is earnestly recommended. Such a corps of field-workers will be of value not only for this purpose but also in connection with the problems of after-care and prophylaxis. Local conditions must largely determine the organization of such a department, but with it, if possible, it would be well to combine a dispensary or outdoor clinic for the purpose of advising incipient cases and the study of lesser and earlier degrees of faulty adjustment than those which are usually received inside the hospital. Such measures are necessary for effective research and are similar to the social service departments which now form so valuable an adjunct to the modern general hospital dealing with patients whose means prohibit avoidable loss of time or work.

The second phase of medical organization upon which I have been asked to touch is that concerning the educational functions of the hospital. These may be dealt with under two headings, the education of the physician and that of the public. Under the first we must consider the training of physicians in general and that of physicians for service in the hospital. It is still a fact that instruction in dynamic psychology and psychiatry is very inadequate in most of our medical colleges. One fact which tends to maintain this state of affairs is that the clinical material necessary for such teaching is to a large extent out of reach of the school by reason of compulsory state care of this class of patient. Another is a somewhat widespread tendency to regard psychology as a realm of myths and speculation more or less beyond the pale of practical medicine. The fact that every medical man is bound to meet and deal with many cases of mental disorder should be a sufficient answer to this attitude. But one

may go much further and state that a knowledge of psychology is essential to all medical practice.

Unfortunately, psychology is made to pay the penalty for the metaphysical fancies of the past as well as for the often undigested and poorly formulated developments and exaggerations of the present, with the consequence that the employment of the adjective "psychic" is for many an indication of the hopeless incompetence of him who uses it. We may compare the attitude of these self-styled "materialists" with one who insists that the only way to discover the cause of the killing of the pedestrian by our automobile is a study of the structure and functional activity of the parts of the machine and who adds that a failure to discover anything wrong is proof only of poor technique. Just so long as the physician ignores the psychic mechanisms of his patients will the various healing cults and other mystic remedies flourish. The doctor untrained in, and ignorant of, such dynamic factors in the maintenance of human life must often fail in his diagnosis and treatment even if he does not cause actual disaster.

Hence there is needed a close association between the hospital for the insane and the medical college whereby the material and the experience of the staff physician become available for teaching. Much is also to be gained by affording the graduate physician opportunities, through clinics and demonstrations, to appreciate and benefit by the special experience of the hospital. The advantages of such association are strictly mutual. The medical staff of the hospital suffers by the isolation which has usually been its lot and needs the stimulus of keeping in touch with the results and methods of research carried on in medical colleges.

For the physician who is to serve on the staff of a hospital something more than this general teaching is required. It is no more reasonable, either for patient or physician, to place the care and responsibility of such a service upon the shoulders of men not specially trained than it would be to give a surgical clinic into such control. The remedy lies in requiring all who enter the service to serve an apprenticeship under the direction of those more experienced on the staff. This to be effective must be carried out systematically, definite periods being allotted to training in all the different departments. Special courses of systematic instruction may also well be provided in connection with the special research departments just as in all universities. Such instruction benefits not only the student but also, and perhaps to an even greater degree, the teacher.

Finally we come to the question of the education of the public in regard to which the duties of the medical staff of a hospital of this kind are also large. The reason for the existence of these special hospitals is the fact that its inmates are in some way incapable of social existence and hence the problems connected with its work must have a close and direct relation to society. More and more, as experience increases, are we forced to realize that the real hopes for the abatement of insanity lie in prevention rather than cure. For preventive measures to be successful the consent and co-operation of the public is essential.

Free access to the hospital and its work must be afforded to all persons whose interest is not mere morbid curiosity, and the staff should realize that such visitations, if properly employed, will assist in making their work more effective. The general practitioner who attends the clinics at the hospital and the properly trained social service worker afford a ready avenue for the transmission of information from the hospital to the public. The hospital reports and such journals as the *Institutional Quarterly*, published in this state, can be utilized to convey facts to many who are specially interested. The staff should be prepared to participate in such meetings as this and also to accept opportunities to address lay audiences under various auspices.

But in undertaking this work I feel that the very greatest care should be exercised to make sure of the grounds upon which such teaching is based and to avoid exaggerated and undigested statements which experience must always unmask for what they are worth. Such ill-advised enthusiasms as those, for instance, which have been at the back of most of the eugenics propaganda must do more harm than good, for they are based upon poorly observed and uncorrelated facts and they cannot possibly accomplish what is claimed for them. The reaction which follows the inevitable failure of such schemes, well intended as they are, cannot help but render the public more suspicious and difficult of approach in regard to future, better founded, efforts towards prophylaxis.

RECURRENT STREPTOCOCCUS VIRIDANS ENDOCARDITIS WITH UNUSUAL MENINGEAL COMPLICATION.

WALTER H. NADLER, M. D., CHICAGO, AND RICHARD F. HERNDON, M. D., SPRINGFIELD.

Streptococcus meningitis, either when it occurs in the course of endocarditis or in other forms of sepsis, is almost invariably fatal. The case, here described,* of endocarditis due to Streptococcus viridans is of special interest by reason of the fact that symptoms of meningitis associated with streptococci in the cloudy cerebrospinal fluid on repeated punctures, occurred in the course of the disease and dominated the clinical picture for nearly two weeks, after which the symptoms subsided and the spinal fluid became clear; after death from cerebral embolism there were found signs of healing meningitis. These findings suggest recovery from streptococcus meningitis—an unusual occurrence. DuBois and Neal[1] have reported the recovery of a case of meningitis due to Streptococcus pyogenes. In a search of the literature they found three instances of recovery of streptococcus meningitis complicating otitis media. Mygind[2] reported six cases of otitic meningitis with recovery after operation, but did not state the nature of infection.

Case Report. The patient, a woman, aged 18 years, was admitted to the medical service of Drs. Tice and Slaymaker in the Cook County Hospital. October 14, 1915, complaining of pain in the legs and arms, of fever and sweats and of headaches. Two weeks previously she had developed a "cold" with cough and precordial pain which lasted 10 days. The day before admission she went to bed because of weakness, epistaxis and fever. There had been no real chill. Appetite was good. She had not menstruated for 3 months.

At the age of ten after a "cold" she had angina and pain in the extremities which kept her in bed for two weeks. One year ago she had a similar illness which lasted 4 weeks.

The patient was well nourished, but anemic and feverish. The left palpebral fissure was smaller than the right. At times the upper lid drooped. The pupillary reflexes were normal. The teeth appeared good, while the tonsils were diffusely reddened. No herpes. Scattered over arms and forearms and less on chest and about knees were petechiae. The head was slightly retracted and the neck muscles were rigid. Precordial pulsation was marked. Apex in the 5th interspace 13 cm. from the mid-sternum. Heart dullness to the 3d rib superiorly, 3½ cm. to the right and 14 cm. to the left of the mid-sternum. The first apical sound was short and loud, preceded by a murmur which was localized, and accompanied by a systolic blow transmitted to the axilla and back. A presystolic thrill was present. Pulmonic second accentuated. A soft systolic blow was heard over the other valve areas. The radial pulse was regular and of fair quality. Blood pressure, 98-57. Spleen and liver were palpable. Ankles slightly edematous. No arthritis. Reflexes were all exaggerated, especially the right patellar. Kernig's sign was persent. Hemoglobin 58 per cent (Dare). R. B. C. 3,840,000; W. B. C. 13,700. Urine was normal. Temperature, of septic type, was 102° F. on admission. Several times it fell almost to normal and remained low for several days. Later it became more irregular, reaching 104°.

Course. Upon admission, meningeal symptoms were most pronounced. The spinal fluid was turbid, under increased pressure, Noguchi positive, 280 cells per cm., 95 per cent of which were polymorphonuclear. Smears contained very numerous intra- and extracellular diplococci staining poorly or not at all by Gram's method, while cultures were negative.

The following day the fluid contained 2,000 cells per cmm. and many extracellular Gram positive diplococci. As it was thought that the apparently Gram negative organisms might be meningococci, 30 cc. of antimeningococcus serum was injected at the time of the first puncture. On the second and third days, also, 30 cc. of serum was used to replace about 20 cc. of spinal fluid withdrawn. On the third day meningeal symptoms were more marked. Ptosis of the left upper lid was complete.

On the seventh day two colonies of Streptococcus viridans were isolated in "shake" cultures of the spinal fluid. At this time a diffuse, profuse, erythematous rash with a few subcutaneous hemorrhages developed. On the tenth day the spinal fluid was much less turbid and the patient was brighter. 450 cells were present. On the eighteenth day, although spinal fluid was almost clear and no organisms were seen in smears, a single colony of Streptococcus viridans was isolated. There were 30 cells per cmm.

Three weeks after admission motor aphasia developed. The patient became semicomatose, temperature rose to 104°. The next day there was complete right sided hemiplegia. Ankle clonus was marked on right side, slight on left. Spinal fluid was again turbid, 1100 cells per cmm. A few cocci were found in smears and several colonies in cultures. On the 23d day right external strabismus appeared. Pupils were small and sluggish. On the 29th day the spinal fluid was clear, contained 10 cells per cmm. and smears and cultures were negative. The mental condition was improved. Spasticity of the right side. Later the patient became brighter and was able to move

*This case has been reported by Dr. Frederick Tice in the Medical Clinics of Chicago, 1916, 1. No. IV, p. 625 and No. V, p. 987.

1. DuBois, P., and Neal, J.: Streptococcus Meningitis with Report of a Cured Case, Arch. Pediatrics, 1915, XXXII, No. 1, p. 28.

2. Mygind, H.: The Operative Treatment of Otitic Meningitis, Jour. A. M. A., 1910, LV, 759.

the right arm slowly. Heart action was weak and irritable.

On the 26th day in the hospital the spinal fluid was clear. No organisms in smear or culture. On the following day, after the appearance of a fresh crop of petechiae on chest and right arm and a right conjunctival ocular hemorrhage, the patient died.

Blood culture made on the first day and on 6 subsequent occasions showed many colonies (10-15 per ccm. of blood) of Streptococcus viridans in pure culture.

The urine contained much albumin and many red blood cells on the 5th day. Cultures a few days later, and at no other time, contained several colonies of Streptococcus viridans. Ten days after onset of hematuria the urine again was normal.

Necropsy. The pericardial sac was obliterated by fibrous adhesions. The heart was greatly enlarged. The narrowed mitral ring measured 6 cm. in circumference. The mitral valve was deformed by calcareous and fibrous thickening. On the free border were two elevated areas approximately 4 mm. in diameter, situated on a base of calcareous material. These areas were soft, yellowish, easily torn from their attachment. On the left lateral wall of the left auricle was an area about 2 cm. in diameter on which were many slightly elevated, soft, yellowish, friable, easily detached thrombi, evidently due to implantation from mitral regurgitation. The other valves were normal. The spleen contained a small infarct. The cerebrospinal fluid did not seem to be increased in amount. The leptomeninges were hyperemic, with very slight fibrinous exudate along the course of the larger vessels, particularly on the right side. The spinal cord was not exposed. The brain contained a soft, gray, purulent, pea-sized area in the left internal capsule. There was a soft area about 2 cm. in diameter in the right temporal lobe in the anterior portion, adjacent to the middle cerebral artery.

Cultures made postmortem from the lesion of the right temporal area of the brain, and from the splenic infarct contained numerous colonies of Streptococcus viridans. Those from the mitral valve excrescences and from the auricular implantations contained Streptococcus viridans associated with Staphylococcus albus.

Cultures. All cultures made from the blood (upon 7 occasions) contained many colonies of streptococcus viridans in pure culture. From the spinal fluid a few colonies were isolated with difficulty (3 times in 7 attempts). Cultures of catheterized urine contained a few colonies only at the time of hematuria. Tonsil cultures showed Streptococcus viridans predominating. The streptococci from these sources and from the postmortem lesions were apparently identical. They were not autolyzed in bile.

Lactose, saccharose, salicin and inulin were fermented regularly, but not mannite and raffinose.

Complement fixation reactions, using patient's serum with an antigen of heat killed suspension of organisms, were not satisfactorily obtained.

Animal Inoculations. Of six rabbits receiving single intravenous injections of cultures derived from the blood, two showed increased pericardial fluid containing organisms. The myocardium and papillary muscles were studded with minute gray-white spots and the kidneys showed a few similar subcortical lesions, which in stained sections were found to consist of collections of streptococci and pus cells. The valves were normal in all cases.

Of three rabbits receiving two injections one showed hemorrhages of the tricuspid valve with exudate, another only hemorrhages, while the third presented only small, miliary hemorrhages in the lungs.

RESUME.

The case is one of chronic mitral disease with a recurrent infection with Streptococcus viridans. The septic character of the disease is shown by the demonstration in culture of organisms from the blood stream, spinal fluid and urine during life and from vegetations and infarcts postmortem.

The history indicates at least two infections with similar onset, four and two years previously. The portal of entry is not certain.

Unusual interest is attached to the predominance of marked meningeal symptoms together with the findings of a streptococcus localization at this site. The process had apparently begun to heal, as suggested by the changes in spinal fluid and by the necropsy findings, interrupted by the death of the patient as the result of cerebral embolism.

Streptococci in the spinal fluid, while very numerous in smears, were grown only with difficulty after repeated attempts. It is interesting to note that the spinal fluid became clear and bacteria-free after the use of antimeningoccus serum. Whether the serum exerted any non-specific bactericidal effect in hastening the healing of the meningeal inflammation is problematic. A similar favorable result followed its use in the case of DuBois and Neal.

THE CRIPPLED CHILD.*

FREDERICK CLEVELAND TEST, A. M., M. D.,

CHICAGO.

The subject of the crippled child is one that has been of deepest human interest from time immemorial. In proof one needs but recall the multitude of authors and artists who with pen or brush have set forth one circumstance or an-

*Read before the Chicago Medical Society, March 7, 1917.

other of this unfortunate victim of inexorable nature. His sufferings, too often helplessness, more than once have appealed to hearts careless or callous to adult woes.

And yet sympathy is by no means the sole emotion that should be aroused. The tragedy is greater far than that of pain alone and one that reaches deeply into our social organization. For in its ramification it stretches widely from the child himself as such and forms a problem involving not only the individual sufferer as a child, but also those upon whom he is at least a care and expense of time and money and often an almost overwhelming burden, mental as well as physical and financial. Nor does the problem limit itself to the childhood years, but too often persists and even increases should the sufferer grow to adult life, so frequently demanding much or all of the energies of some devoted kin or other caretaker in addition to the reduction or obliteration of the economic efficiency of the individual himself. How often are cripples dependent in part or entirely upon others for comfort or even continued existence, aside from being themselves able to play but little or no part in the maintenance of our social structure which for its fullest development should have the cooperation of us all at our uttermost endeavors. Distorted skeletons and muscles palsied or drawn unavoidably lay a toll upon the nervous and mental constitution of the one afflicted, the effect of which we see on every hand.

On the mother while she lives in most part falls the heaviest burden. She it is on whom thrust strongest those keen, sorrowing sympathies that only motherhood can bring and on her, too, lie the greatest physical demands. Small wonder that so often both nervous and physical organization gives way under the continued double strain. But others of blood bond have their parts to play and the influence and need for help draws frequently upon strangers, as nurses, medical advisors, dispensaries, hospitals and charitable organizations; the last in their turn dependent for support upon still other members of society. So it is that the crippled child, frail, suffering bit of humanity that he is, reaches out his beseeching hands to all of us.

For present purposes, the children crippled through tuberculous infection are sufficient topic, but they are only a small third part of our crippled children, whom we may briefly review. Slightly less in number than the tubercular deformed, are those on whom rickets has put its mark, in shape of bowlegs or knockknees. Of all classes of deformities, perhaps these have the greatest probability of being restored to anatomical correctness and consequent maximum efficiency in future life. Nor if neglected and untreated does rickets disable its victims to so great a degree, generally speaking, as do some other causes of deformity. Beginning so early in the life of the individual and exerting a deforming influence for so comparatively short a time, Nature by herself in the ensuing years of growth frequently, almost or entirely, obliterates the early ravages. And when such is not the case, in the vast majority of instances, the damage is more along esthetic than disabling lines, and yields to self-treatment with loose trousers or long skirts.

Such, however, is not the case where the ricketty deformity takes the phase of scoliosis, which, with lateral spinal curvatures due to other causes, make up some ten per cent of cripples. Here there is no spontaneous tendency to self-correction, but rather to persistent and rapid increase, too often difficult of full correction, despite all methods, however ingenious or apparently anatomically correct, where skeletal changes of much degree present. The scolioses of non-ricketty origin, whether paralytic or of various static causations, present difficulties of their own, which must be combated whenever possible, or a distorted torso with displaced and damaged vital organs will generally be the ultimate result and the economic efficiency suffer along with the general health. One unfortunate feature in connection with scoliosis, especially in cases coming to dispensaries, is that the condition is either not recognized until it has become well established or it has been neglected in the belief that the child will outgrow it, so favoring the permanence of the deformity with its resulting deterrent influence on the individual's efforts for livelihood. Too much stress cannot be laid on the importance of early diagnosis and uninterrupted treatment.

Anterior poliomyelitis, from available statistics, seems to have furnished in the past some ten per cent. of the deformities of childhood in Chicago. In New York the percentage has been somewhat less. It will, however, take but few epidemics such as have prevailed of recent years

in various parts of the United States, to greatly increase this proportion. Though the resulting deformities range from helpless disability to but slight involvement of some of the foot muscles, the majority of cases present deformities of one or both legs below the knee, fortunately often amenable to treatment by operation or brace or both, with resultant improvement in locomotion and consequent better facilities for wage-earning, as well as physical comfort. One feature to be considered is the liability of some cases to a scoliosis, through unequal balance of body muscles. The trophic disturbances also often retard limb development so that through a shortened leg a static scoliosis may ensue. A census under way among the crippled children attending Chicago schools, indicates that fully one-third of them owe their deformities to anterior poliomyelitis, which may be interpreted as indicating the ambulatory nature of many of these deformities or at least that mental disturbances do not keep pace with the muscular.

The opposite is the case with the paralyses of cerebral origin which furnish some two or three per cent. of all cases of deformity. It is the rule rather than the exception in these cases for the spastic muscles to be accompanied by noticeable or marked lack of proper mental development, too often failing to respond adequately to the most conscientious efforts in training. It is perhaps here, with warped body and scarred brain, that the crippled child finds his most pitiable exemplification. And yet, many of those so afflicted can, by dint of proper care and training, be lifted into positions of self-helpfulness and even enabled to be self-sustaining.

Congenital defects, chief among which are clubbed feet and hip dislocations, constitute approximately ten per cent. of all deformities. Of these, the club feet are at the present time so generally subjected to treatment, with such usually satisfactory results, that as an element of adult disablement they are practically negligible, a state of things quite different from that prevailing in former generations, when many congenital club feet went on to adult life uncorrected. The percentage of correctible congenital hip dislocations, too, has greatly increased in the past twenty years and the condition is by no means the bugaboo of earlier years. Club hands, congenital shoulder dislocation, intra-uterine amputations, congenital elevation of the scapula, spina bifida, and other less common congenital defects but difficult of alleviation, are fortunately rare.

Static foot deformities, per se, are comparatively infrequent among children, usually not appearing until adolescence or later. Probably an over-arching is the most common minor disturbance of the juvenile foot, sometimes most likely referable to an extremely light and unrecognized attack of anterior poliomyelitis, and again of doubtful origin. A true sag-foot—I prefer the term to the more common, but often inaccurate expression flat-foot—is not common in children, but may present after some severe systemic infections or be the result of rapid increase in body weight. Taut-foot, that tightening of the Achilles tendon and increase of the longitudinal arch, with the usual flattening of the transverse arch, which is so common a result of high-heeled shoes, rarely appears before high school age, and is practically a feminine deformity.

More common in Chicago children, are the deformities due to maiming accidents from street cars, automobiles or wagons with resultant amputations of feet, hands, legs or arms. In the more densely populated sections of the city, where the street is still the usual playground, despite the increasing number of small parks, children so crippled are by far too numerous.

Acute infections and congenital syphilis play their part, but it is a minor one compared with that of tuberculosis. From loop to suburb the bacillus strikes at the bones of its child victims among rich and poor to the amount, as before stated, of practically one-third of all the child cripples. In nearly one-half of these the spine is the part involved, with the hip affected in approximately a third of the cases, and the knee, ankle and other joints in lessening degree. The significance of this in disabling effect is readily perceived. Upon the integrity of the vertebral column is the stability of the whole body dependent, to say nothing of possible paralyses by invasion of the spinal cord and proper locomotion is incumbent upon normal legs. Tuberculous bone infection then chooses as foci those anatomical regions whose involvement most effectively disables the patient. Add to this the long course of the disease, the usual bone destruction, the liability of metastases, the small percentage of anatomically perfect cures and the considerable mortality, and we concede bone tuberculosis the most dread enemy of the crippled

child. Improved though our modern methods unquestionably are, we still must admit regretfully that our results are immeasurably less perfect than we should like and the more earnestly strive for further improvement. Immobilization and hygiene must be our keynotes in treatment; the first to prevent or lessen deformity, and the second to shorten the course of the infection. Brace, cast, frame or bone splint must be used as our best judgment dictates, coupled with the most nutritious diet, fresh air and lastly sun treatment, which in the past few years is forging to the fore as an adjunct whose value we have been slow in fully appreciating. The closing of discharging sinuses, sometimes of years' duration, during a summer's exposure of the involved area to the direct rays of the sun, at first for five minutes daily, and then with as rapid increase as possible, to the full period of daylight, is becoming more and more common and is encouraging to the highest degree. The use of vaccines and sera from the tubercle bacilli has been disappointing to many, and yet in the hands of others has seemed to a valuable adjunct. Personally it has seemed as though perhaps the failures might in part be due to an error in the protein substances selected for injections, as for instance, a bone infection due to bovine bacilli might theoretically be expected to yield, if at all, better if a preparation from bovine bacilli were employed, but the subject is as yet too controversial and the possibilities of mixed infection too great, to warrant any dogmatic assertions. But on the absolute necessity of immobilization and hygiene there can be no argument.

Chicago presents some interesting features in regard to the distribution of bone tuberculosis within its confines. Whether they are dependent upon the proven fact that a large proportion of bone tuberculosis in children are of the bovine type, cannot now be said. But the statistics at hand show that in an area three miles equare, with the Stockyards in the center, the cases of bone tuberculosis comprise forty per cent. of all the cases of deformities. In the remainder of the city the percentage of bone tuberculosis cases to all other deformities is but twenty-nine and a half. Some of the cases in this category date back a quarter of a century, and there is no possibility of ascertaining whether the infection was of human or bovine type, and consequently, it is but theorizing to recall that at that time there were many more tuberculous cattle herded in the stockyards than now is the case. The possibilities in the proximity of infected cattle, and of the inhalation of wind-borne bacilli, however, suggest a plausible speculation. Be that as it may, the same statistics show a percentage of but twenty-nine for tuberculous bone deformities on the West Side, in spite of all its many congested tenement districts.

The ethnology of the crippled child is of no small interest. To go back to the deformities due to rickets, by far the majority of such cases in Chicago are, by recent ancestry at least, from sub-tropical regions, particularly those lying about the Mediterranean, as they occur chiefly among the Italians, Greeks, Syrians and Negroes, in whom over eighty per cent. of the deformities are ricketty. The Scandinavians show only ten per cent.; the Irish, fifteen; the Germans, twenty, and the Americans, twenty-five. But the term American in this sense is an elastic one, though it is intended to cover at least two generations in this country.

As regards scoliosis, it comprises over twenty per cent. of deformities in Germans and Bohemians, fifteen in the Irish, and but six in the Americans, while among the Mediterranean races the cases are so few as to be notable.

Anterior poliomyelitis appears to be quite indiscriminate in its selection of races.

Congenital deformities make eleven per cent. of the American deformities, and ten per cent. each in the Irish, German and Scandinavian; five per cent. in the Polish and but two per cent. among the Negroes.

In contradistinction to rickets, more northern regions give a greater susceptibility to bone tuberculosis, as among Americans these deformities form forty-three per cent. of the whole, while the English, Irish, Scandinavians and Poles show almost fifty per cent. each. The Germans are somewhat less, with thirty-five per cent.; the Negroes have about thirteen per cent. of their deformities tuberculous, and the Mediterranean races suffer comparatively little, at least in Chicago, from bone tuberculosis.

It would appear, then, that in this city, perhaps the most cosmopolitan in America, the problem of the crippled child is of peculiar importance, as the various ethnic strains allow him

to appear in protean forms. Considering that the bulk of our population is of North European ancestry, and that those nationalities have proven the most liable to tubercular infection, it seems likely that the problem of bone tuberculosis is the one which will require the most vigorous struggle. But let us so conduct ourselves that our Crippled Child, be he Briton, Scot, Celt, Scand, Teuton, Slav, Frank, Latin, or Greek, when he arrives at manhood, may prove a sound American.

SPECIAL BULLETIN STATE BOARD OF HEALTH

Several numbers of *Illinois Health News*, the official bulletin of the State Board of Health, are now ready for the mails, and will be found to be especially interesting publications devoted to special lines of public health and sanitary work.

The December number contains a summary of the activities of the Board of 1916, and has been held back on account of pressure of work in the office, making it impossible to obtain all the data necessary for this annual report. The January, February, March, April and May numbers are all special numbers, devoted to dairies and dairy inspection, water supply and sewage disposal, child welfare and the management of baby week and baby shows, and rural sanitation and sanitary privies and well protection. The April number is devoted to the recent meeting of the Illinois Public Health and Welfare Association and to the outline of the plans of the new Department of Public Health.

NEW CIRCULAR ON CLEAN-UP CAMPAIGNS

The State Board of Health has recently issued a useful circular on clean-up and anti-fly campaigns. This circular will be sent in any reasonable quantities without cost upon application to the Secretary of the State Board of Health, Springfield, Illinois.

This circular, of sixteen pages, is devoted to the details of arranging and handling clean-up campaigns. There is added a section, prepared by the Bureau of Sanitary Engineering, devoted to the plans of simply-constructed fly traps.

MUNICIPAL SANITARY SURVEYS

The city of Quincy is undergoing a "birdseye sanitary survey" which is being carried out by a representative of the United States Public Health Service at the instance of the women's clubs of that city.

A sanitary survey is contemplated by the people of Freeport.

The April number of *Health News* will contain a preliminary report of the sanitary survey of Cumberland County, made through the cooperation of the United States Public Health Service and the State Board of Health under the direction of Surgeon L. L. Lumsden, of the Public Health Service.

IMPROVED WATER SUPPLY FOR JACKSONVILLE

As the result of an appeal from the city of Jacksonville, the State Board of Health, the State Water Survey and the State Geologic Survey have presented a plan for the development of an adequate supply of pure water. For the time being the city will increase the number of wells now employed and, in the future a system of larger supply will be worked out.

'TWAS EVER THUS

"The Devil was sick,
The Devil a monk would he.
The Devil got well,
And Devil a monk was he."

When I am well I josh the doc, and say his pills are made of chalk, which never cured a human ache; that all his science is a fake. I roast him bitterly because he is too handy with his saws, and seems so anxious to remove one's backbone from its oldtime groove. But when my organs all go wrong, and I'm no longer hale and strong, but doubled up with grievous pains, clear from my fetlocks to my brains, the doctor is my only hope; I clamor for his pills and dope. And if he brings his saw and spade, and says he thinks he'll have to wade all through my system with the same, I say, "Go on, and hew my frame!" And when I'm lying on my bed, with poultices upon my head, I murmur softly to the nurse, "The good old doc no more I'll curse! His science kept me from the grave, and after this I will behave." But when I'm on my feet once more I hang around the corner store, and say the doctor is a fake who couldn't shoo away an ache. Thus, when our cares have taken wings we hoot and jeer at solemn things.—*Chicago Daily News.*

WALT MASON.

DO YOU KNOW THAT

The constitution of the United States doesn't mention health?

Procrastination in sanitary reform is the thief of health?

A book on "Exercise and Health" may be had free for the asking from the United States Public Health Service?

Not everybody can achieve greatness, but everybody can be clean?

If you sow a hygienic habit you reap health; reap health and you attain longevity?

Railway cars would be sanitary if it weren't for the people in them?

America's typhoid fever bill is more than $270,000,000 a year?

ILLINOIS MEDICAL JOURNAL

Published monthly by The Illinois State Medical Society, under the direction of the Publication Committee of the Council.

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State society will pay no bills for legal services except those contracted by the committee. Notify the Chairman at once. Don't employ attorneys.

MAY, 1917

Editorials

My Country First, Then

BLOOMINGTON.

Illinois State Medical Society,

May Eight, Nine and Ten.

Welcome.

Yes, we are preparing to welcome fifteen hundreds guests at our state meeting this year. Bloomington does things right. You will be met at the depot with autos and will not be left alone until you are cosily located in your quarters for the week. Should our hotels prove inadequate our good people will open the best homes in the city to you and you will be escorted to your room, where you will sympathize with the poor fellow who has to put up with a mere hotel. If anyone has to do without a bed that week it will be the Bloomington doctors, for they will be so busy showing you a good time they will have no time to sleep. Remember, Wednesday is ladies' day. And, by the way, if you must have a private room, just notify me that you will bring your wife and I will see that you get it. Clubs all have open house that week for the entertainment of the doctors; a stag affair that will rejuvenate the most aged. For reservations write Dr. L. B. Cavins or myself and we will see that you get it.

Don't think because you have written one hotel and failed to get reservation that there is no room for you. *There is room for all.*

Come.

T. D. CANTRELL.

THE BLOOMINGTON MEETING.

Now is the time for every member of the Society to arrange to attend the annual meeting at Bloomington. It is also the time for every member to show interest and loyalty to the State Society. No state medical society is giving as much to its members as the Illinois Medical Society is giving, and the members owe it to the Society to attend this meeting and assist in making the Society serve the profession more fully.

The day has passed when a state medical society meets, holds a scientific meeting, a formal social function, hands a compliment to some few members by electing them to office, and returns home, its labors ended. The activity of the various committees and officers has been greater during this year than in any year of the society's existence, and each year will call for more work from them, than on preceding years. This the members should appreciate fully, and appreciating it attend the one yearly meeting, giving the committees and officers the benefit of their counsel.

The program this year we think is an unusually good one. Bloomington will treat you royally. You, Doctor, are missing a treat if you do not attend, and also, Doctor, you are not assisting the Society of which you are a member or the profession which you love, by remaining home.

EYE, EAR, NOSE AND THROAT SECTION.

The officers of the Section on Eye, Ear, Nose and Throat have succeeded in securing many of our leading men to read papers and give demon-

strations for our meeting. The program will fully attest to the fact that it is a good one, and should be the means of bringing out a large representation of men in our specialty. We would urge upon our confreres the desirability of having you with us on this occasion. Tuesday, May 8th, the day (from 10 a. m. to 5 p. m.) will be devoted to Clinics and Demonstrations; the work of the morning will be at St. Joseph Hospital and the afternoon at Brokaw Hospital. Luncheon will be served at the noon hour. The evening of May 9th at the Country Club will occur the banquet. The hour is 7 p. m. The price per plate is $2.50. Kindly note the attached card and send in your acceptance at once. Wednesday, May 9th, the day will be devoted to the reading of papers. Place of meeting will be Auditorium of the Masonic Temple. Session will convene at 9:30 a. m. During the meeting days special entertainment will be provided by the local committee. Speakers at the banquet will be Dr. Kellogg Speed, who will give us a talk on War Experiences in France, illustrated with stereopticon slides, and with special reference to the Eye, Ear, Nose and Throat. Mr. Robert J. Folonie, Attorney of the Illinois State Medical Society, will give us a snappy talk on a subject that will be enlivening to the occasion. In addition, there will be several stunts arranged by the local committee.

Begin now arranging your work so you may attend this meeting and we sincerely trust that you will be with us both at the Clinic on Tuesday, May 8, and the Session Work on Wednesday, May 9, and thus contribute to the undoubted success of the meeting.

Fraternally yours,

RICHARD J. TIVNEN, President,
Suite 800 Monroe Building, Chicago.

J. SHELDON CLARK, Secretary,
State Bank Building, Freeport.

ILLINOIS STATE MEDICAL SOCIETY

SIXTY-SEVENTH ANNUAL MEETING.

Bloomington, May 8, 9 and 10, 1917.

ORDER OF PROCEEDINGS

Registration Office and Headquarters in the Exhibit Hall in the basement of the Masonic Temple.

First Day—Tuesday Morning

10:00 Clinics for Section on Eye, Ear, Nose and Throat.
Eye and Ear, Brokaw Hospital.
Nose and Throat, St. Joseph's Hospital.

Tuesday Afternoon

2:30 Call to order of the Society in General Session by the President, William L. Noble, of Chicago. Auditorium of Masonic Temple.
Report of Chairman of the Committee on Arrangements, H. L. Howell, Bloomington.

3:00 Call to order of the Secretaries' Conference by the President, H. B. Henkel, of Springfield. Auditorium of Masonic Temple.

Tuesday Evening

7:00 Banquet of Section on Eye, Ear, Nose and Throat. Country Club. Dr. Kellogg Speed and Mr. R. J. Folonic, both of Chicago, will speak at the banquet. Price per plate, $2.50.

8:00 Call to order of the House of Delegates, by the President, William L. Noble. Blue Lodge Room Masonic Temple.

Second Day—Wednesday Morning

9:00 Call to order of Sections One and Two for Reading and Discussion of the Papers of the Program. Auditorium of Masonic Temple.
Call to order of the Section on Eye, Ear, Nose and Throat, R. J. Tivnen of Chicago, Chairman. Blue Lodge Room, Masonic Temple.
Call to order of the Section on Public Health and Hygiene. G. F. Ruediger of La Salle, Chairman. Basement of Masonic Temple.

12:30 Adjournment for Luncheon.

Wednesday Afternoon

2:00 Call to order in General Session by the First Vice-President, C. F. Newcombe, of Champaign. Auditorium of Masonic Temple.
President's Address, William L. Noble, Chicago.

2:30 Reconvening of the Sections.

Oration in Medicine, Aldred S. Warthin, Ann Arbor, Michigan.

Third Day—Thursday Morning

9:00 Call to order of Sections One and Two for the Continuation of the Program.
11:00 Oration in Surgery, Alexius McGlannan, Baltimore, Md.
12:30 Adjournment for Luncheon.

Thursday Afternoon

1:30 Reconvening of Sections One and Two.
4:00 Call to order by the President to Receive the Report of the House of Delegates. Induction of the President-elect.
5:00 Final Adjournment.

ENTERTAINMENT FOR MEMBERS AND LADIES

Wednesday Afternoon

12:00 Automobile Ride.
1:30 Luncheon, Bloomington Country Club House.

Wednesday Evening

7:30 Theatre Party.

OFFICIAL PROGRAM.

SECTION ONE.

Frederick Tice, Chairman, Chicago.
C. Martin Wood, Secretary, Decatur.

SECTION TWO.

James H. Finch, Chairman, Champaign.
John S. Nagel, Secretary, Chicago.

Wednesday, May 9, 1917, 9 A. M.

Diabetes—The Initial Fast and Tolerance Testing .....E. J. Brown, Decatur
Discussion, A. C. Croftan, Chicago.

A New and Efficient Method for the Diagnosis and Determination of the Cure of Gonorrhea.....Louis D. Small, Chicago
Discussion, C. Hugh McKenna, Chicago.
Discussion, Darwin Kirby, Champaign.

Radium.....Albert Welfeld, Chicago
Discussion, W. A. Melton, Warrensburg; Henry Schmitz, Chicago.

Caesarean Sections.....H. M. Orr, La Salle
Discussion, George B. Kelso, Bloomington; T. J. McKinney, Champaign.

Constipation, Its Causes and Management..
.....C. E. Wilkinson, Danville
Discussion, L. C. Taylor, Springfield.

Late Results of Goiter Operations.....
.....E. P. Sloan, Bloomington
Discussion, Frank Buckmaster, Effingham; C. U. Collins, Peoria.

Hemolytic Jaundice.....C. A. Elliot, Chicago
Discussion, W. H. Nadler, Chicago.

Wednesday, 2 P. M.

President's Address..William L. Noble, Chicago

Oration in Medicine—"The Role of Syphilis in Internal Medicine".....
....Aldred S. Warthin, Ann Arbor, Michigan

Prostatectomy in Tabetics.....
.....E. Starr Judd, Rochester, Minn.

Individualization in the Treatment of Surgical Inflammations .....
.....Edward H. Ochsner, Chicago
Discussion, George G. Davies, Chicago; Benjamin F. Lounsberry, Chicago.

Roentgen Findings in Luetic Lesions.....
.....E. S. Blaine, Chicago
Discussion, W. G. Bain, Springfield; H. W. Grote, Bloomington.

Vagatonia .....Frank P. Norbury, Springfield
Discussion, W. A. Crooks, Rock Island.

The Lower Abdominal Incision.....
.....Henry T. Byford, Chicago
Discussion, Frank T. Andrews, Chicago; Franklin H. Martin, Chicago.

One Step Further in the Treatment of Acidosis in Children .....
.....H. C. Blankmeyer, Springfield
Discussion, Joseph Brennemann, Chicago.

Operation for Cystocele by the Abdominal Route .....W. L. Gray, Champaign
Discussion, T. J. Watkins, Chicago; F. W. Barton, Danville.

Thursday, May 10, 1917, 9 A. M.

SYMPOSIUM

(Papers limited to fifteen minutes.)

Specificity and Non-specificity of Vaccines
.....D. J. Davis, Chicago

Vaccines for Prophylaxis.....
.....G. F. Ruediger, La Salle

Vaccines in Internal Medicine.....
.....Louis J. Mix, Chicago

Vaccines in Typhoid Fever.....
.....S. R. Slaymaker, Chicago

Vaccines in Pertussis.....
.....Henry W. Cheney, Chicago

Discussion, O. L. Schmidt, Chicago; F. J. Mittan, Decatur.

Head Injuries with Special Reference to Their Intracranial Complications.....
.....T. A. Davis, Chicago

Oration in Surgery—"The Conquest of Cancer".....Alexius McGlannan, Baltimore, Md.

The Physician and the Proof of Death or Disability, for the Insurance Company..
.....C. U. Collins, Peoria

Discussion, S. E. Munson, Springfield.

Fracture of the Pelvic Bones and Resulting Injuries to the Urethra and Bladder.....
.....H. C. Mitchell, Carbondale

Discussion, O. O. Stanley, Urbana; Carl E. Black, Jacksonville.

Surgical Emergencies in the Uro-genital Tract and Their Management.....
.....F. Kreissl, Chicago

Discussion, E. P. Sloan, Bloomington; Lewis Wine Bremerman, Chicago.

"Lest We Forget," or Crawford W. Long, the Discussion, C. U. Collins, Peoria.

First Anesthetist....C. B. Johnson, Champaign

Role of the Prostate in Acute Gonorrheal Infections .....Ben Baird, Galesburg

Discussion, C. M. Rose, Galesburg; W. L. Karcher, Freeport.

Morbidity Incident to Obscure Hernias....
.....J. L. Wiggins, E. St. Louis

Discussion, Don Deal, Springfield; W. F. Grinstead, Cairo.

Plastic Surgery.....Lawrence Ryan, Chicago

Filariasis from a Surgical Standpoint.....
.....H. M. Greaves, Sidney

Discussion, J. S. Mason, Urbana.

An Etiological Study of Arthritis.....
.....Warren L. Rainey, E. St. Louis

Discussion, Nathaniel Allison, St. Louis, Mo.; Philip Kreuscher, Chicago.

Section on Eye, Ear, Nose and Throat

BLUE LODGE ROOM, MASONIC TEMPLE

R. J. Tivnen, Chairman, Chicago.
J. Sheldon Clark, Secretary, Freeport.

Eye, Ear, Nose and Throat Clinics

Tuesday, May 8

Eye and Ear Work at Brokaw Hospital beginning at 10 a. m.

Luncheon at Brokaw Hospital.

Nose and Throat Clinic at St. Joseph Hospital, Tuesday afternoon

Banquet.—At 7 p. m. a banquet will be given for the section at the Country Club, at which special entertainment will be provided. Dr. Kellogg Speed will give an illustrated talk on "Surgical Experiences in France, With Special Reference to Eye, Ear, Nose and Throat." Mr. Robt. J. Folonie, attorney for the Illinois State Medical Society, will give a talk on a subject that will be of interest to all. Price per plate, $2.50.

Wednesday, May 9, 1917, at 9 A. M.

Reading of papers will commence at 9 a. m., Blue Lodge Room of the Masonic Temple. A stereopticon will be provided. Papers limited to 10 minutes and each discussion at two minutes.

Program.

Treatment of Catarrhal Deafness. M. F. Arbuckle, E. St. Louis. Discussion, I. M. Miller, Kewanee.

What the State Can Do to Prevent Blindness. Willis O. Nance, Chicago. Discussion, A. L. Adams, Jacksonville.

The Sub-Mucous Operation. John A. Cavanaugh, Chicago. Discussion, Oliver Tydings, Chicago.

Treatment of Membranous Cataract. Harry Woodruff, Joliet. Discussion, Francis Lane, Chicago.

Operative Procedures on the Nasal Accessory Sinuses. Illustrated. Norval Pierce, Chicago. Discussion, A. H. Andrews, Chicago.

"Radical Mastoid Operation; Its Termination with Reference to Hearing and Suppuration." Charles H. Long, Chicago. Discussion opened by C. C. Clement, Chicago.

Eye and Ear Work in a General Hospital. Frank Allport, Chicago. Discussion, Arthur M. Corwin, Chicago.

The Management of Tonsillar and Adenoid Hemorrhage. Henry R. Boettcher, Chicago. Discussion, Joseph Z. Bergeron, Chicago.

Primary Mastoiditis With Report of Case. Robert Sonnenschein, Chicago. Discussion, Wright C. Williams, Peoria.

Depressed Nasal Deformity Corrected by Bone Transplantation. L. Ostrom, Rock Island. Discussion, Frank E. Brawley, Chicago.

The Treatment of Vitreous Opacities. Wesley Hamilton Peck, Chicago. Discussion, James W. Dunn, Cairo.

The Importance of After-treatment Following Tonsillectomy. C. F. Burkhardt, Effingham. Discussion, John E. Deal, Springfield.

Optic Nerve Involvement in Tabes and General Paresis on the Line of New Investigation. Geo. F. Suker, Chicago. Discussion, R. C. Matheny, Galesburg.

Some Observations on the Decompression Operation on the Hypopysis by the Nasal Route. Otto J. Stein, Chicago. Discussion, J. Holinger, Chicago.

Management of Malignant Disease of the Upper Respiratory Tract. Illustrated with stereopticon slides. Joseph C. Beck, Chicago. Discussion, S. A. Friedberg, Chicago.

The Kronlein Operation. Edward E. Edmondson, Mt. Vernon. Discussion, Mayer H. Lebensohn, Chicago.

The Use of Bacillus Coli Communis in the Treatment of Tuberculosis of the Larynx. Harry Kahn, Chicago. Discussion, Otto T. Freer, Chicago.

Operation for Anterior Synechia With Report of Cases of Secondary Glaucoma and Staphyloma in Which It Was Used. Chas. G. Darling, Chicago. Discussion, H. Gradle, Chicago.

The Use of Trichloracetic Acid in the Treatment of Atrophic Rhinitis. W. G. Hatch, Rockford. Discussion, Thomas O. Edgar, Dixon.

Presentation of a Device to Immobilize the Head and Eye Lids During Operations on the Eye Ball. E. R. Crossley, Chicago. Discussion, E. H. Garraghan, Chicago.

Diagnosis of Acute Mastoiditis and Indications for Operation. A. E. Sherman, Aurora. Discussion, Cassius M. Craig, Champaign.

Section on Public Health and Hygiene

Gustav F. Ruediger, Chairman, La Salle.
Grace H. Campbell, Secretary, Chicago.

BASEMENT OF MASONIC TEMPLE

Wednesday, May 9, 1917, at 9 A. M.

The Physician and Public Health.....
.....William E. Park, Rockford
Some Phases of Medical Supervision of Employees .....W. E. Post, Chicago
Some Observations on the Epidemiology of Poliomyelitis.....C. W. East, Galesburg
Practical Methods of Sewage Disposal.....
.....Edward Bartow, Univ. of Illinois
Medical Legislation .....
.....C. St. Clair Drake, Springfield
The Division of Engineering of the State Board of Health .....
.....Mr. Paul Hanson, Springfield
Hygiene of Pregnancy...Effa V. Davis, Chicago
Studies in Meningitis.....A. Levinson, Chicago

SYMPOSIUM

The Responsibility of the State to the Epileptic Child .....J. C. Krafft, Chicago
The Responsibility of the State to the Nervous Child .....J. W. Van Derslice, Chicago
The Responsibility of the State to the Choreic Child.....C. B. King, Chicago

Secretaries' Conference

H. B. Henkel, President, Springfield.
Flint Bondurant, Vice-President, Cairo.
Ostella Blakely, Secretary, Fairfield.

AUDITORIUM OF MASONIC TEMPLE

Tuesday, May 8, 1917, at 3 P. M.

President's Address...H. B. Henkel, Springfield
The Organization of Medical Legislative Work in the County Society.....
.....F. C. Gale, Pekin
The Duties and Problems of the Secretary of an Active County Medical Society.....
.....T. G. McLin, Jacksonville
The Importance of Legislative Work.....
.....Don Deal, Springfield
Medical Organization in Reference to Legislative Work .....T. D. Doan, Scottville

Exhibitors

Horlick's Malted Milk.
The Loeser Smith Co.
Taylor Instrument Co.
Sharp and Smith.
Wm. Meyer and Co.
Weder Manufacturing Co.
Radium Chemical Co.
The Abbott Laboratories.
J. R. Siebrandt.
W. B. Saunders Co.
Standard Oil Co.
Mellins Food.
Lederle Antitoxin.
Reed and Carnrick.
Phillips Chemical Co.
P. Blakiston & Co.

Central City Chemical Co.
The Standard Laboratories.
W. D. Allison Co.
John McIntosh & Co.
A. S. Aloe & Co.
Childs Drug Co.
Geo. W. Birde & Co.
C. V. Mosby & Co.

MEDICAL MEN FOR THE ARMY.

The Committee on Medical Preparedness is endeavoring to organize the medical forces of this state for service in the United States Army. The government wants to know where to get medical men, and wants to have them ready for service.

It is a great opportunity for the young man who has not yet built up a practice. It will, of course, be a sacrifice for the older man who has an established clientele demanding his service, but sacrifice must be, and the older men must go if called upon.

We predict there will be no trouble in raising the quota of medical men needed from Illinois. In fact, we are satisfied that several times the required number needed could readily be secured if necessary. The medical profession has always carried its full responsibilities and will now. When the president calls, the profession of Illinois will respond, even to the last man.

MEDICAL MEN FOR THE NAVY.

Is there discrimination in choosing medical men for the Navy? If so, why?

These questions may well be asked. Just why an order is issued from the office of the Surgeon General of the United States Navy to accept applicants who are graduates of Class A medical schools without medical examination for the naval service, should be explained. It is manifestly unfair and undemocratic to refuse the graduate of a Class B school the same privilege that is offered the graduate of a Class A school. The graduate from a Class B school may be just as patriotic, and it is just possible he may be better fitted.

A compilation of results of State Board examinations, such as was recently issued by the Journal of the American Medical Association, does not show all of the poorly equipped men have graduated from Class B schools. Such a report intimates that a number of Class A schools are not turning out men so well equipped as some of the Class B colleges. So far as medical education is concerned, it may be well to classify medical colleges as A, B, C, etc., but such a classification has no place in the United States Navy or Army. Examine the men and see if they are fitted for the service.

If a man is a graduate from a school recognized by the state board of examiners of the state in which the school is located, he should have the privilege of application and examination for the government service, and it is not well if a small clique is influencing the naval authorities in such relations.

It is to be regretted if our highest naval medical authorities take such a narrow, limited view, and it will have a very deleterious effect on the committees authorized by the president to raise a medical force for the government service. When the great state of Illinois examines the permits students from certain schools to practice, it is hardly pertinent for the Surgeon General to say all men from these schools are ineligible for government service.

AMERICAN PROTOLOGIC SOCIETY.

The American Protologic Society will hold its Nineteenth Annual Meeting in New York City, June 4 and 5, 1917. Headquarters and place of meeting, Hotel Astor. The profession is cordially invited to attend all meetings. The program promises some good papers, and, no doubt, the meeting will be well worth attending.

THE ALIENISTS AND NEUROLOGISTS.

The annual meeting of Alienists and Neurologists will be held Monday, July 9, to Thursday, July 12, 1917, in the Red Room, La Salle Hotel, Chicago, under the auspices of the Chicago Medical Society. Dr. George A. Zeller will act as chairman. The program will be mailed June 28, with abstract of each paper. Contributors to the program are solicited. This is a society without a membership fee.

Address Bayard Holmes, M. D., Secretary A. & N., Room 1218, 30 N. Michigan Ave., Chicago.

Contributions of the subjects listed on the following tentative program are desired. A synopsis of each paper to be placed upon the permanent

program must be in the hands of the secretary on or before Saturday, June 23.

PROGRAM

TUESDAY, JULY 10

MORNING SESSION 9:00 A. M. TO 12:30 P. M.

Topics—State Hospital Architecture; exhibition of plans and photographs. State Hospital Custody; Administrative Problems of State Hospitals; Hospitals for Cure, Research and Prevention; Colonies for the Productive Insane; Therapeutic Employment and Re-Education.

AFTERNOON SESSION 2:00 P. M. TO 5:30 P. M.

Topic—General Paralysis of the Insane.

EVENING SESSION

One evening session will be held open for an entertainment or for important topics, should any arise. At present, Monday evening, July 9th, or Tuesday evening, July 10th, seem most preferable.

WEDNESDAY, JULY 11

MORNING SESSION 9:00 A. M. TO 12:30 P. M.

Topics—Maniac Depressive Insanity, and the Minor Psychoses; Delirium Tremens, Traumatic Mental Disturbances.

AFTERNOON SESSION 2:00 P. M. TO 5:30 P. M.

Topic—Legal Aspects of Insanity.

The evolution of legal practice involving the question of mental integrity. Relations of Insanity to Criminal Practice.

EVENING SESSION

Topics—Special Program. A joint meeting with the Chicago Medical Society in the Marshall Field Annex Building.

THURSDAY, JULY 12

MORNING SESSION 9:00 A. M. TO 12:30 P. M.

Topic—Dementia Præcox.

AFTERNOON SESSION 2:00 P. M. TO 5:30 P. M.

Topics—Epilepsy. The Feebleminded.

NOTICE.

Rush alumni dinner will be held Wednesday, May 9, at the First Baptist church. Please notify the undersigned by 10 o'clock May 9, if possible.

F. C. VANDERVORT, Vice-President,
Bloomington.

Correspondence

A QUESTION OF IMPORTANCE.

A matter of serious importance to the medical profession has just been concluded in the Municipal Court of Chicago.

During the last winter, Dr. William A. Lurie, a practicing and licensed physician and surgeon, was arrested upon the complaint of George West, acting for the State of Illinois Dentistry Board, claiming a violation of the act prohibiting practice of dentistry. Dr. Lurie, after being arrested and placed in jail, was released on bond and the matter came on for hearing on April 12, 1917, before His Honor, Chief Justice Olson, of the Municipal Court and a jury. The questions raised by this case were as follows:

The complaint asserted a violation of law in that the defendant is alleged to have practiced dentistry without having secured a license as a dentist, and undertaken to treat a disease or lesion of the jaw. The Attorney-General gave as his opinion that a physician and surgeon may not treat any disease having its situs at any place in the jaw, and that this is by law made the field of the dentist exclusively. The import of this opinion was that a physician may not treat any disease affecting the jaw, as for example sarcoma of the jaw infection in the antrum of Highmore tuberculosis having manifestations in the jaw—caries of the jaw bone—oysteomyelitis—*pyorrhea alveolaris*, although its origin be nephritis, diabetes, etc. The effect of this opinion is such that if given its full effect, if an anesthetic were administered to a patient for a tonsillectomy, and there was present also a fracture of the jaw or a resection of the jaw were necessary for a fibroma, that a dentist would have to be called in to render that portion of the service relating to the jaw.

The particular treatment on which the complaint in question was based was that of draining an antrum *per ora* at the site of the second bicuspid, and the antrum infection extending through the floor of the antrum into the adjoining jaw tissue was curetted. There was a condition of the jaw which is ordinarily classified the loose designation of *pyorrhea alveolaris* (the term literally means pus discharging from the jaw). The physician has so long felt secure in his right to correct human ailments wherever they may exist that it may come as somewhat of a shock to find that the Dentistry Act, so-called, defines the practice of dentistry as the act of *any* person "who may treat or profess to treat any of the diseases or lesions of human teeth or jaws, or extract teeth, or prepare and fill cavities in human teeth, or correct malposition of teeth, or supply artificial teeth as substitutes for natural teeth; provided that nothing in this act shall be so construed as to prevent regularly licensed physicians or surgeons from extracting teeth."[1]

1. Ill. Rev. St. Ch. 91.

It was the opinion of the Attorney General that the proviso permitting physicians or surgeons to extract teeth, by necessary implication excluded them from any intervention except that expressly so excepted. The Dentistry Act makes no other proviso or exception as to physicians and surgeons than as above mentioned. The Medical Act, however, makes provision that nothing *therein* contained shall apply to the laws regulating the practice of dentistry.

The defendant in the instant case called upon the Chicago Medical Society and the Illinois State Medical Society for assistance, which was rendered through their counsel and appropriate committees, although not strictly within powers delegated to them. The matter was regarded of so much moment as to warrant deviation from the letter of the powers of the respective committees. It was anticipated that the condition of the patient treated would be described as *pyorrhea alveolaris* by the prosecution, and on this theory defense was prepared on the proposition that although a manifestation in the jaw was treated, nevertheless power of the physician to treat the diseased antrum and to have the patient under observation and treatment was a necessary incident of the practice of medicine.

The defendant had observed the ethics to the last degree, as we believe, having remitted the patient to a dentist for the removal of artificial dentures, sent her to an extractionist for the extraction of teeth, and sent her to a dentist for the fitting and replacing of artificial dentures after the process of healing was complete. The patient had been under treatment for several years for nervous prostration and gastritis, and was sent to the defendant by a brother physician to diagnose and seek correction of these constitutional conditions by necessary treatments about the head and jaw.

The position was taken for the defense that whether infective conditions in the antrum and jaw should more justly be treated as a local or primary focus, productive of constitutional changes and debility, or whether the constitutional infection and debility should more justly be looked upon as secondarily producing the focus in the jaw, upon the theory of an end organ malnutrition plus infection, is a question which is probably not definitely settled and that any attempts to eliminate the consideration of the physician from the entire bodily condition, including jaw conditions, would be highly unfortunate.[2]

The present prosecution was viewed as an undue attempt to limit the field of medicine and surgery, and thereby limit jaw treatments to those having no knowledge of the body as a whole, the tendency of which is, as one writer describes it, "to detach one's view from a broader outlook in medicine. The patients who have suffered loss of life by operative intervention of dentists in diabetic pyorrhea are not inconsequential in number."[3]

After hearing the case as presented on behalf of the state, an informal discussion was had between the Assistant Attorney General, counsel for the defendant, and the court. Among other things, the court stated that he was of opinion that a physician treating a jaw had a right to do anything necessary about a tooth which is incidental to treating the jaw; that if it was a medical case the fact that a tooth was affected and treatment about it involved, it would be within the sphere of the physician. The court said the law was intended to reach those who held themselves out as practicing dentistry, and not cases where a physician is legitimately treating a disease where treatment about a tooth is an incident of the treatment. The court expressed doubts whether the law could be held constitutional if so construed that it would prohibit a doctor from treating a cancer of the jaw. The Attorney General, after calling the complaining witness, Dr. West, before the bar of the court to hear the conclusion of the matter, stated that he did not believe there was sufficient evidence for a conviction, and moved to dismiss his suit. The court thereupon entered a *nolle prosequi* which is the equivalent of a dismissal of the case out of court.

It is hoped that the defeat of this prosecution will cause the Attorney General to see the fallacy of his position, into which he was doubtless led by adherence to the letter of the law rather than its spirit. It is within the possibilities that further arrests may be made in case of physicians operating upon the jaw. A great deal of work has been done by the committees in charge in the preparation of this matter, and invaluable assistance rendered by prominent members of the

2. Journal A. M. A., Feb. 10, 1917, p. 417.
3. Journal A. M. A., Apr. 14, 1917, p. 1085.

profession, whose assistance was asked and most cheerfully and ably rendered. It is deemed proper to give publicity to this matter because of the general interest to the profession, and also with a view to making available the various defenses prepared in this case for the use of other physicians who may not know where to turn if they should be unexpectedly arrested for claimed violations of the dentistry act.

Respectfully submitted,

ROBERT J. FOLONIE,
General Counsel.

Public Health

THE NEW STATE DEPARTMENT OF PUBLIC HEALTH

Through the passage of the consolidation bill, which Governor Frank O. Lowden made the definite issue of the early days of his administration, Illinois is now in a position to develop a health department which should compare favorably with that of any of the larger States of the Union. Two years ago, when the Efficiency and Economy Committee of the General Assembly began the consideration of the combination and coordination of existing State departments and bureaus for the purpose of more efficient government, the State Board of Health was asked to submit a plan through which better health administration could be obtained in Illinois. In spite of the fact that the administration of the Medical Practice Act, with the examination and licensure of physicians, other practitioners, midwives and embalmers, had become a great burden to the Board, occupying three-quarters of the time and attention of the members, the officers and the clerical force, it was then believed that it would not only be necessary for the reorganized Board to carry this load, but that it would also be necessary for them to assume the examination and licensure of those engaged in professions and trades more or less associated with public health, such as dentists, pharmacists, nurses, optometrists and barbers.

With an appreciation of the importance of the public health very unusual in laymen in public life, Governor Lowden so arranged the consolidation bill that the State Department of Public Health was relieved of all responsibility for examination and licensure, and was made a health department pure and simple, being one of the nine major divisions of the State Government. The examination and licensure of physicians, together with all other matters of examination and licensure, were transferred to the newly created Department of Registration and Education.

According to Dr. Drake, Director of the Department of Public Health, the foundation of the department will be the system of district health officers established in Illinois two years ago. At the present time the State is divided into five sanitary districts, each of which has assigned to it a full-time medical health officer. This officer is charged with the responsibility of sanitary and health conditions in his own district; but the entire corps of district officers constitutes a mobile force which may be employed any place in the State in times of emergency.

It is Dr. Drake's hope that at least ten district health officers may be placed in service this year, and that eventually there will be a district health officer to every 100,000 of population in the State outside the city of Chicago.

Behind this group of district officers, who bring the State Health Department into direct contact with every community of the State, there will be, under the new organization, a group of experts, located at Springfield and ready to render specialized service. Each of these experts will be the chief of a bureau.

In charge of the entire organization will be the Director of the Department of Public Health, with the Assistant Director. These two officers are to be appointed by the Governor, but the consolidation law specifies their qualifications and experience.

As an advisory body, the law provides a Board of Advisors on Public Health, made up of men serving without salary, who may offer suggestions to the Director, either without his invitation and who may also offer suggestions affecting the health of the State of the Governor or to the General Assembly. This Board has the right to investigate the operations of the Department of Health, and must be accorded every facility for so doing.

Among the bureaus planned by Dr. Drake are the following:

An Executive Bureau, which consists of the office of the Director and has to do with general administration, the purchasing of supplies, accounting, merit lists of employes and general administration.

A Bureau of Communicable Diseases, under the direction of the State Epidemiologists, which has to do with the prevention and suppression of communicable diseases; education on these subjects, the investigation of epidemics and the distribution of preventive and curative sera, vaccines, etc.

A Bureau of Tuberculosis, charged with anti-tuberculosis education, the making of tuberculosis surveys, the passing upon plans of county tuberculosis sanatoria, the organization of campaigns for county sanatoria, the inspection of hospitals and sanatoria for the treatment of the tuberculous. This bureau will work in close co-operation with the Illinois Tuberculosis Association.

A Bureau of Sanitary Engineering having to do with sanitary surveys, matters concerning water supply and sewage disposal, passing upon plans of building or rebuilding water supplies, sewage and waste disposal.

A Bureau of Child Hygiene charged with educational work in the prevention of undue mortality among children, the establishment of child welfare stations, assisting in baby week and baby show programs, etc.

A Bureau of Surveys and Rural Nursing to engage in rural sanitary work and the establishment of community nursing service. This department will devote attention also to dairies outside municipal corporate limits.

A Bureau of Lodging House and Hotel Inspection charged with the sanitary conditions of hotels and lodging houses and with the enforcement of certain laws affecting them.

A Bureau of Diagnostic Laboratories to operate a diagnostic laboratory at Springfield and branch laboratories in each of the sanitary or health districts of the State.

A Bureau of Vital Statistics for the registration of births and deaths under the new Birth and Death Law. This bureau will also have charge of the statistical work of all of the other bureaus of the department.

A Bureau of Public Health Education in charge of the publication of all circulars and pamphlets of the department and controlling the exhibits, motion pictures and other educational material.

The chiefs of these bureaus will constitute a staff of experts available to the district health officers and the physicians and people of the state, and they will constitute the staff of the health officer schools which will be held in each health or sanitary district.

The new law creating the State Department of Public Health will go into effect on July 1.

THE ILLINOIS PUBLIC HEALTH AND WELFARE ASSOCIATION

The first annual meeting of the Illinois Public Health and Welfare Association held in Springfield on April 12 and 13, is said to have been one of the most successful public health meetings ever held in the middle west. The Association is the coming together of all of the special organizations of the State interested in any phase of public health or welfare work and includes in its membership both the governmental and extra-governmental organizations. The Association, while entirely independent, is in close affiliation with the State Board of Health.

A clergyman living near Leyden was the father of thirteen children. The eldest, born December 31, 1668, was Herman Boerhaave, accounted by many the most famous physician not only of the 18th, but probably of any century. He died of gout in 1738.

He was an indefatigable teacher, sometimes lecturing five hours a day to his students at Leyden. He was the first to give separate lectures on ophthalmology (the science of diseases of the eye) and to use a magnifying glass in the examination of the eye. He combined, with a desire to study disease at the bedside, a freedom from theoretical and philosophical influence which led him to use the most modern diagnostic apparatus which he could secure. He was so famous that a Chinese official once sent him a letter addressed simply: "To the most famous physician in Europe." This maxim was "Simplicity is the seal of truth."

The modern diagnosis of disease aims to employ every method which will reveal the exact mental and physical condition of the patient. Psycho-analysis will reveal the depths of the patient's mind almost as clearly as the x-ray shows the broken bone hidden beneath the body tissues. The pressure of the blood against the vessel walls may be accurately measured and appropriate means taken to ward off an apoplectic attack. The bodily excretions may be analyzed and the efficiency of the excretory organs determined. Special apparatus permits the examination of the eye, the ear, the nose, throat, bronchi, and the interior of various other parts of the body. Nothing is taken for granted; the blood is examined; the activity of the stomach is estimated; the validity of the nervous system is looked into. The modern physician finds the disease before he treats it.

Accurate diagnosis is of importance to the public health because an early and correct knowledge of the presence of a disease affords opportunity to prevent its spread. The case of tuberculosis, which is found early, has an infinitely greater chance of recovery than the one which is found late. Boerhaave recognized these facts in a general way and applied them; in fact, according to Rohlfs, he was the first who made a chemical examination of some of the bodily excretions.

The Association of Military Surgeons of the United States announces the results in the Henry S. Wellcome Prize Competition. Captain Mahlon Ashford, M. C., U. S. A., who wrote on the subject: "The most practical plan for the organization, training and utilization of the medical officers of the Medical Reserve Corps of the United States Army and Navy, and of the Medical officers of the Officers' Reserve Corps of the United States Army, in peace and war," was awarded a gold medal and three hundred dollars. First Lieut. Henry C. Coe, M. R. C., of New York City, who received the honorable mention for this prize, was awarded a life membership in the Association. A silver medal and two hundred dollars was awarded to Assistant Surgeon General W. C. Rucker, U. S. P. H. S., whose essay was entitled: "The influence of the European War on the transmission of the infections of disease, with special reference to its effect upon disease conditions of the United States." Passed Assistant Surgeon J. H. Hurley, U. S. P. H. S., received honorable mention for this prize and a life membership in the Association. These prizes, which were given by Mr. Henry S. Wellcome, an American living in London, are annually competed for by officers of the Army, Navy, Public Health Service, the National Guard and the Officers' Reserve Corps of both the Army and the Navy. The essays of the successful contestants will be published at an early date in *The Military Surgeon.*

A reliable disinfectant which may be made for fifty cents per gallon has been devised by the U. S. Public Health Service?

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This list is corrected in accordance with the best information obtainable at the date of going to press. County Secretaries are requested to notify The Journal of any changes or errors.

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Auto Sparks and Kicks

STORAGE BATTERIES.

Most battery troubles come from neglect or want of knowledge of a few essential facts. These essentials are limited to number.

Do not subject battery to duty for which it is not intended.

Keep battery properly charged.

Keep battery cells filled with pure water.

If operating with a generator, see that it is right and not over-charging or under-charging the battery.

KEEP BATTERY PROPERLY CHARGED.

If not in service, every storage battery should be charged for a few hours every 30 days. Never allow it to stand without charging to exceed 60 days.

SPECIFIC GRAVITY TEST.

The specific gravity of a battery when fully charged is between 1.275 and 1.300.

Specific gravity is tested by a hydrometer syringe, having a glass tube with a float which accurately indicates the amount of acid in solution. If specific gravity is shown by the reading of the hydrometer to be below 1.250, the battery should be recharged.

When battery is fully discharged, the specific gravity is about 1.150.

Note—Never test battery immediately after filling with water, as this will not give the correct reading.

If the cell always regularly requires more water than the others, a leaky jar is indicated.

If there is no leak and if the gravity is or becomes 50 or 75 points below that in the other cells, a partial short-circuit or other trouble within the cell is indicated.

Keep battery and interior of battery compartment wiped clean and dry.

KEEP BATTERY CELLS FILLED WITH WATER.

Every liquid storage battery should be filled with pure water. This should be done once a week in hot weather and every two weeks in winter. Failure to do this may result in sulphating and ultimate ruin of the plates. Water for this purpose should be distilled or filtered rain water from a wooden roof.

Fill every cell so as to cover the plates; do not flood. Test for gravity before adding water.

If by accident the liquid has been spilt from the battery, fill with solution made of one part of chemically pure sulphuric acid to ten parts of pure water.

Caution—Never take a naked flame near battery while charging or directly after being charged. The gas coming from the battery is liable to ignite and cause trouble.

Any liquid battery placed in storage should be kept fully charged to prevent freezing and breaking of jars.

Hard acid batteries will not freeze.

CHARGING HARD ACID BATTERIES.

The hard acid battery cannot be tested by the hydrometer, since, as its name implies, there is no free solution to test. Therefore, its condition can be known only by its service. When used for either ignition or direct lighting as the battery approaches the point of exhaustion it should be charged the same as the liquid battery except that at the time of each recharging a limited quantity of solution must be added to each cell, just enough to cover the plates. This solution should be on part C. P. sulphuric acid to ten parts of pure water.

This solution is absorbed by the hard acid, leaving the battery non-freezing and non-spilling.

AUTO SCIENCE MADE SIMPLE.

Here's a little science made over to fit the unscientific. A bearing without lubrication of any nature develops a maximum amount of friction. The ideal performance would be to reduce that maximum to nothing. Then your car would run like a streak of greased lightning and not half try. But you can't do it. The best you can do is to pare it down by using oils or greases. Naturally, some oils and greases are better than others. Certain frictional conditions require a different cure, a different kind or degree of lubrication.

With a graphite lubricant you can reduce friction to almost nothing.

Lubrication of both motor and chassis is always the one important item in the life of a car. Graphite added to the lubricant used makes lubrication much more perfect. The graphite oils and greases are far superior to the plain greases for almost any bearing.

Society Proceedings

COOK COUNTY
CHICAGO MEDICAL SOCIETY

ABSTRACT

Scientific Meeting, March 21, 1917

The President, Dr. A. Augustus O'Neill, in the Chair.

Dr. Frederick G. Dyas read a paper on "Local Anesthesia." He stated that various drugs and freezing sprays have been used and have played an important part in the production of local anesthesia, but it remained for novocain to fill the long-felt want. This substance is only about one-seventh as toxic, and yet possesses to a remarkable degree its property of producing analgesia, and used in sufficient dosage to produce local anesthesia is practically without toxic effect. In the summer of 1916 another substance was introduced experimentally to take the place of novocain, which was almost unprocurable. This agent is known as apothesin. It is used in the same strength and dosage as novocain; its toxicity is about the same, and it has the same resistance to boiling. The speaker said he had performed about 85 major operations with the aid of apothesin and he considers it in no way inferior to novocain as a local anesthetic. For a long time local anesthesia was almost wholly confined to operations upon the eye, nose and throat, and had it not been for the introduction of the less toxic novocain and adrenalin, which made possible the development of the technic of infiltration anesthesia and nerve block, the method would in time have been abandoned. The author drew the following conclusions: 1. The patient's life is not endangered by dosage sufficient to induce local anesthesia. 2. The general comfort of the patient after operation is much improved because of lessened trauma and decreased gas pains. 3. Convalescence is not complicated by the anesthetic and is thereby shortened. 4. Ambulatory patients may be immediately discharged after operation. 5. An anesthetist is unnecessary, but a "Moral Anesthetist" is desirable. 6. The use of adrenalin renders the field less bloody, prolongs anesthesia, delays absorption, and thereby lessens toxicity. 7. Nerve-block as a lasting anesthesia for chronic pain should find as wide an application as its use for operative procedure.

Dr. Weller Van Hook read a paper on "The Anatomical Relations of the Goitrous Thyroid." The author pointed out that the entire thyroid may enlarge, or only a part or parts may increase in size. The force which brings about increase in size is very great and acts from within the gland itself. The peculiar, even bizarre, effects which we see clinically are to be explained by keeping in mind the facts already mentioned and the additional fact that the trachea and esophagus, the neighboring bones, the muscles and fascia, the arteries and the nerves offer lines and planes of resistance to growth. It is only by a careful study of the planes in which free expansion may occur and the forces that drive the thyroid or its parts against them that we can comprehend at a glance the meaning of the multiplicitous forms of goiter which we meet with in practice.

In a paper on "Radium in Gynecology" Dr. Henry Schmitz was of the opinion that diseases of the female pelvic organs exhibiting a proliferation of tissue elements or the formation of a new growth can be beneficially treated with actinotherapy. He stated that he had subjected to radium treatment 22 hemorrhagic and 6 inflammatory metropathies, 13 uterine myomata, and myomatosis, 94 primary and recurrent inoperable uterine, 17 rectal and 14 genito-urinary carcinomata—a total of 166 cases. He considered it unfair to compare the results of radium therapy in the treatment of carcinoma with those obtained by surgical methods, as surgery is employed in strictly localized cancers, while radium is used in advanced cases, but the author stated that radium is the best palliative remedial agent in this disease, although it could not be called curative until observations have extended over a period of at least five years. Radium therapy has not yet been completely developed, and that it would require many years of careful observation and close study by the clinician and physicist to perfect the technic. He believed that the therapeutic application of radium is an art which can be acquired by the most painstaking observation and close application, while in the hands of the uninitiated radium is directly dangerous. The rays are wonderfully controllable if one knows how to use them, and terribly destructive if not held within bounds. It is the best palliative in inoperable cancers, properly selected, where it will cause a healing in about 65 per cent of the cases and a subjective improvement in an additional 15 per cent.

Scientific Meeting, March 28, 1917.

Dr. John L. Whitman (House of Correction) spoke on "The Influence of Alcoholism in the Production of the Criminal, Pauper and Insane." His personal observation of alcoholics extends over a period of 18 years in an official capacity at the County Jail as well as over 10 years at the House of Correction. During that time they had become impressed with the idea that it was of great importance that the physical condition of the patients should be carefully studied. Public sentiment was not very strong in favor of giving to the inmates of institutions much more consideration than was due them on account of the crime committed, but at the House of Correction they found Dr. Sceleth in accord with their ideas. At least 30 per cent are in advanced stages of alcoholism, and the chances of their being rehabilitated are not very good, yet there is a possibility of some individual cases being made better citizens after scientific treatment.

Dr. Charles E. Sceleth read a paper on "Alcoholism as Observed at the Sceleth Hospital of the House of Correction, With Autopsy Findings." During the past 17 years 40,000 cases of chronic alcoholism have passed through the institution for treatment. This

did not include the acute alcoholic intoxication occurring in cases that are not suffering from chronic alcoholism. Dr. Sceleth was of the opinion that no matter what measures are taken by the legislators, the manufacture and sale of these poisons to a laity so generally ignorant of the harm they may produce, and the real anatomic changes is certain to be restricted here as elsewhere in the near future. He said he could not estimate the financial cost of the chronic alcoholic to society, but if the government absolutely prohibited the manufacture of distilled liquors he believed the work of the police department and municipal courts would be cut in half, and that the population of the police stations, workhouses, prisons and reformatories would be reduced 50 per cent, the asylum 25 per cent, and the poverty and misery of the world 75 per cent.

Judge Thomas F. Scully discussed the subject from the standpoint of the County Judge. He said he did not know much about alcohol, but had seen some of the results of the excessive use of alcohol, as it is his duty to try insane cases on an average of 100 a week, the greater percentage of which were alcoholic. He believed that if the doctors would interest themselves just a little in the youth of the city, the boys and girls who drink alcohol to excess because they don't know the effect that drink has upon them, they could do a great amount of good; that if the physicians of the city or county or state would hold meetings in the schools and advise the young men and girls before they reach the age of manhood and womanhood of the effects of the excessive use of alcohol, they might be able to save a large per cent of those who finally spend their days in the House of Correction or in one of the state insane asylums.

Dr. Bernard Fantus spoke on the "Pharmacology and Therapeutics of Alcohol." He stated that the most hotly debated question had been the food value of alcohol, but it must be admitted that less than 10 per cent of alcohol ingested is eliminated; often only 2 per cent, so that 90 to 98 per cent must be oxidized in the system, and so has a high caloric value, a dram of whiskey having the same caloric value as a dram of sugar, four calories. It is also well established that in conditions of starvation alcohol is capable of serving the system in place of fat or carbohydrates. When food is taken in and alcohol is taken in addition, the alcohol renders some of the food superfluous, so there is a tendency to obesity, the development of gout, etc., and this action of alcohol renders its foods value not only undesirable but strictly harmful. So while alcohol is a food, it is a toxic food. He believed the best use of alcohol to be external, as it is an excellent disinfentant and is often useful in the treatment of infections of various kinds.

Dr. H. I. Davis, in discussing the general aspects, said he thought the men who are preaching prohibition are not preaching it from the right point of view; they are telling us that if the manufacture of alcohol is stopped men will not drink, but he thought this was not true. We do not live properly; we are spending our nervous force and in trying to recuperate men turn to alcohol.

Judge William N. Gemmill discussed the subject from the standpoint of the Municipal Court, saying that the purpose of the laws in this land is that every boy and girl born on American soil shall have an equal opportunity to secure the fruits of life; that the powerful shall not crush the weak and helpless. Our schools are maintained that the boys and girls may be prepared to go out into the world with a fair opportunity to win their way in the battle of life; and it should be our task to give the children of these drunken parents some sort of a chance.

Scientific Meeting, April 4, 1917.

Dr. Jefferson D. Griffith, Kansas City, Missouri, read a paper on "The Responsibility of the Surgeon and the Frequent Cause of Death Immediately Following Operative Work." The changes, he said, brought about by the general acceptance of the first antiseptic and the aseptic principles of surgical cleanliness cannot be realized by the younger generation of surgeons whose medical education was finished after 1885. Prevention has become the watchword of the medical practice, and through the successful employment of the preventive methods of the present day surgery has become a conservative branch of human art. The elimination of accidental disturbances of repair caused by wound infection has decreased the percentage of mortality following operations to a most remarkable extent. The dread of undertaking and of submitting to surgical operations is greatly diminished, hence allowing earlier surgical interference to the possible advantage of both patient and surgeon.

Dr. Jacob Frank discussed the subject from the standpoint of the army surgeon. The author feels sure that if this country should become involved in a conflict with a foe it would be the civil surgeon who would be called upon to do the surgical work, as the army has not enough surgeons.

Dr. John Ridlon, in speaking from the standpoint of the orthopedic surgeon, considered the responsibilities before the operation just the same as those of the general surgeon, but stated that there were very few deaths in the work of the orthopedic surgeon unless he is a careless or experimental surgeon.

Dr. Charles H. Parkes, in speaking from the standpoint of the general surgeon, said the future should hold some intelligent, honest, comprehensive reform for the elevation of the ethics of surgery. The law of the survival of the fittest will not solve the problem.

Dr. Charles S. Bacon, in speaking of the subject from the standpoint of the obstetrical surgeon, stated that every obstetrical case is a surgical case to some extent. In every case there is a wound which is liable to infection and hemorrhage—liable to any action that any would is liable to, and most cases are liable to the dangers of anesthetics as well, so the responsibility of the obstetrical surgeon is greater than that of the general surgeon.

Dr. Channing W. Barrett, discussing the subject

from the standpoint of the gynecological surgeon, said that while a general surgeon may take out a gall-bladder or an appendix, the gynecologist might have to do that in combination with various things. From the standpoint of responsibility he had not often been able to "put himself in the patient's shoes" and had not always been able to "consider what he would do if he were in the same condition," but he thought it was always well to take into consideration what was the very best thing to do for each patient.

J. V. Fowler, M. D.,
Secretary.

CHICAGO OPHTHALMOLOGICAL SOCIETY

Meeting of Oct. 16, 1916, Continued.

SYMBLEPHARON.

Dr. John A. Pratt, Aurora, reported a case of complete symblepharon. The eye had been burned by hot metal and the doctor in charge had performed evisceration. The particular feature about the operation for symblepharon that was different from anything he had ever seen was the making of a double row of holes in the large tin plate prothesis used, and the suturing of the Thiersch graft to the plate, which sutures were cut after six days. The entire graft seemed to have taken, but had contracted to one-third of its original size. His idea now is, to build the superior and inferior fornix with the foreskin of a small child, instead of the use of Thiersch grafts.

He would like to know if any member had ever used foreskin in the place of Thiersch graft, and if so, what the result had been.

He intended to do a Week's operation. While the eye seemed to be doing well, more operations are necssary.

Dr. Suker stated that foreskin, if used as a graft, acted very nicely when transplanted. There was this disadvantage, however, that it contracted much more than skin taken elsewhere. A graft of foreskin would take readily, but in the end result was not quite as good as it might be.

CALCAREOUS DEPOSITS IN THE CORNEA.

Dr. Harry S. Gradle reported the case of a man who came to see him a week ago with a history of having had repeated ulcerations of the cornea, evidently of neuropathic origin, for the past seven years. He had had twelve ulcerations during this time. The last attack occurred last September. The Wassermann reaction was negative; tuberculin reaction was negative.

An interesting feature is the calcareous deposits particularly in the right eye. There is one deposit over the pupillary area, the result of the last attack in December and January. Patient had tried practically everything without avail. He had gone through routine procedures, such as massage and heat, without relief.

It was suggested by an internist that in hyperparathyroidism there is a deficiency of calcium in circulating plasma. The patient had been fed large quantities of parathyroid extract, trying to produce a deficiency of calcium, which will lead to some absorption of the calcium in the cornea. If this is of no avail, the only thing is to resort to some form of operation.

Paul Guilford, Secretary.

CHICAGO OPHTHALMOLOGICAL SOCIETY

A regular meeting was held December 18, 1916, with the president, Dr. William E. Gamble, in the chair.

SINUS DISEASE AS AN ETIOLOGICAL FACTOR IN IRITIS

Dr. E. E. Irons and Dr. E. V. L. Brown contributed a joint paper on this subject. In 100 cases of iritis studied etiologically for luetic, gonococcal, tuberculous, dental, tonsillar, sinus and other infections, the authors found abnormalities of sinuses suggestive of infection in 18 cases, but considered sinus infection the etiologic factor only in the three cases given below. In the other 15 cases the etiologic factor was considered to be luetic in 6, gonococcal 1, dental 1, tonsillar 1, and so combined that no one factor could be considered the certain factor in 6.

Case 1.—Housewife, aged 45. Left acute iridocyclitis; duration 3 weeks; relieved by atropin, etc. Just previous to the eye trouble the patient had had a cold, with nasal discharge. Frontal sinusitis was found clinically and by x-ray. Slight tonsillar infection was noted in one tonsil. No clinical or laboratory evidence of dental, luetic, gonococcal or tuberculous infection could be found. (1, 3 and 8 mg. O. T.) Tuberculin used under careful control and after due consideration of the general condition of the patient. Treatment of the sinus was refused.

Case 2.—Printer, aged 34. Bilateral chronic iridocyclitis, duration off and on since 9 years of age. Pansinusitis, but no other evidence of active tonsillar, dental, luetic, gonococcal or tuberculous infection could be found on careful clinical and laboratory study (7 mg. O. T.). Three weeks' atropin treatment had no effect upon the pupil or the "rose-flush." Operative sinus treatment was refused.

Case 3.—Male, aged 20. Left chronic serous iridocyclitis began in February, 1913. The right antrum had been drained 7 months before. After the tonsils were removed in August, 1913, the eye condition improved, but during 1914 there were repeated exacerbations, with occasional periods of fever, sub and intracutaneous, and intramuscular tender nodules, but no change in the slight presystolic apical heart murmur, during two years of observation. Blood cultures during three of exacerbations remained sterile. The teeth were normal and there was no clinical or laboratory evidence of luetic, gonococcal, or tuberculous infection (1, 3, 7 mg. O. T.). A complete reexamination during a recurrence in August, 1915, revealed an active antrum infection. The antrum was drained and cultures of the pus showed a slightly hemolytic streptococcus. The eye improved. A suspension of 100 million killed streptococci was injected subcutaneously as a test of sensitiveness to this organism. Forty-eight hours later right ciliary infection became more marked and the clear left eye became red. This reaction lasted 40 hours and then subsided without local treatment. Four days later the procedure was repeated with a smaller dose and after 24 hours the same reaction appeared in the right eye, with some pain, but no redness in the left, and subsided within 72 hours. Feb. 2, 1916, the patient reported the eyes improved, and the rhinologist stated that the sinuses were clear of infection. In this patient the evidence seemed fairly clear that the source of the recurrences of the iridocyclitis was a persistent infection of the sinuses.

DISCUSSION

Dr. Alexander S. Rochester said that the cases reported by the essayists reminded him of a case which he treated some months ago, particularly when the essayists spoke of the possibility of not finding a present sinus trouble. He saw the patient in his third attack of iritis within a period of two years. In each attack the patient was taken care of by a competent oculist, a different oculist each time. Each time he had been referred by the oculist to a rhinologist, but examination of the nose had not disclosed any sinus trouble. Each time the patient had had a "cold" in the nose at the time the iritis came on. Each attack lasted for several months, and with the usual treatment of atropin, hot applications and sodium salicylate, the eye had gradually cleared up, the patient being told he had had rheumatic iritis. When patient consulted the speaker he had an iritis which had begun three or four days before. In examining the nose he used the suction apparatus which Brawley had spoken of and which he thought was of great value. The first day he was not able to find anything pathological in the nose at all. He used atropin and hot applications, and the next day the patient's eye was worse. On examining the nose again and putting the patient on the suction apparatus for a while, at the end of about twenty minutes some pus escaped from the anterior ethmoidal region. Within several hours after this, the eye was very much better and in two or three days quieted down. He kept up the use of the suction apparatus and the eye became completely quiet, and later on he opened up the ethmoid so as to establish drainage. He thought the suction apparatus was of great value in the diagnosis of these cases, as well as of great aid in their treatment where it was necessary to use conservative methods.

Dr. Harry S. Gradle asked whether Dr. Brown considered the iritis in sinus disease an infection or a toxemia.

Dr. Brown said he considered it to be an infection transferred by the circulating blood.

Blood cultures had been made in the last case, but were all negative.

Dr. Michael Goldenburg mentioned a condition in point where it affected the optic nerve. The wife of a dentist developed a unilateral neuro-retinitis, which was very marked. Every form of examination had been made and nothing could be found that might account for the condition. The teeth were x-rayed, a Wassermann examination was made, urinalysis and blood count made, and a radiograph of the skull was made in order to show up the ethmoidal cells. In the ethmoid region on that side, in one spot was seen a small area of possible infection. The matter was placed before the husband and he was told that the speaker did not feel that that was the cause of it, but that was the only thing that could possibly account for the condition. It was decided to open the ethmoids, which was done. No pus was found, but in the substance removed, after floating in water, there was a little membrane which took the form of a bag, that was possibly a cyst. The eye began to recover in a comparatively short time. Patient was nevertheless placed on small doses of mercury and iodid of potassium. The eye recovered with almost normal vision. In the course of a month or so afterwards she developed an acute infection of the antrum on that side, which was easily diagnosed, by transillumination and irrigation. At the same time another attack of neuro-retinitis which was just as marked as the preceding one developed. Vision went down to 20/200. The antrum was drained, and the patient made a perfect recovery. She has not had a relapse for a year and a half or more.

Dr. Frank Brawley, in referring to the point raised by Dr. Gradle as to whether these conditions are due to a localized infection or to toxemia, stated that in his experience he had gained the impression that a toxemia is really the cause. He had had a number of cases, some of which he had reported, where rapid improvement resulted from the evacuation of the sinus or following the use of the suction pump and drainage, so that he could scarcely see how one could explain it on any other ground than that of a toxemia. The case cited by Dr. Rochester would tend to support that theory, and particularly as Dr. Brown and Dr. Irons had found absence of organisms in the blood with the most careful technic.

Dr. Harry S. Gradle did not think that the conditions of optic neuritis and uveitis due to accessory sinus trouble were at all identical. He agreed with Dr. Brawley that sinus disease was probably due to toxemia, but optic neuritis, due to accessory sinus disease, was an extension of the process to the soft tissues from the accessory sinus through the orbit, involving the intracanalicular portion of the nerve. The same therapeutic measures would tend to relieve the two conditions.

Dr. J. B. Loring stated that in determining the etiological factor we might think of several things to assist us, either there is an increased infection occurring or a diminished local resistance. He recalled a case he had quite a number of years ago at the time of the celebrated "Boodle trial" in Chicago. An attorney concerned in the defense of that suit was doing an immense amount of work and had infection of the antrum. He was also the subject of lues. It was thought that his case of iridocyclitis was due to syphilis, but as thorough treatment as could be carried out at that time failed to give any appreciable relief. The case persisted. After the antrum was drained effectively the trouble rapidly subsided. This man was doing an excessive amount of work at that time, and the iritis came on.

Another case, seen two or more years ago, was that of an artist decorator in the city, who was also doing an excessive amount of work at that particular time. He had noticed no change so far as the antral disease was concerned, having known that it was present for some time, and it having been recommended that the antrum should be drained. With his hard work he was practically prostrated. The iridocyclitis followed. Prompt relief was afforded after drainage of the antrum and keeping it up. Perhaps a close study of these cases might reveal points of increased focal infection. Take arthritis. There is usually either an exacerbaion of the focal lesion or a diminished resistance at the point of onset, as seen in trauma, not that trauma has anything further to do with it than the production of a local diminished resistance. In the same way in a joint infection, the infection not involving the synovial secretion, but being external to the joint, there is a similar anatomical circulation in the villi in the joint as in the ciliary body and in the iris, increased irritation inducing stasis, rendering infection much more liable to be set up.

Dr. Benjamin Bailey, Lincoln, Nebraska, congratulated Dr. Irons and Dr. Brown on the work they had done along this line. Ophthalmologists had followed the old nomenclature of ciliary, specific, traumatic iritis long enough, and when they did not know the cause, and there had been no trauma and syphilis could not be demonstrated, the iritis was put down as being of rheumatic origin. He believed that the procedure undertaken by Dr. Brown, if followed up, would amount to a great deal. It was high time that ophthalmologists discriminated more closely regarding each type of iritis met with. In common with other ophthalmologists he had had the same result in finding oftentimes ethmoidal or accessory sinus disease of some nature that complicated the iritis. Again, he had been unable to find the cause and had to depend upon the usual remedies for treatment which the doctor had suggested, atropin, hot applications, and salicylate of sodium, etc. If this work was carried on we would be able to revamp the nomenclature and get the different forms with greater accuracy, and consequently would have better methods of treatment as the result of these investigations.

Dr. George F. Suker asked Dr. Brown whether in his experience with these cases he had noticed that in some types the iris as a whole or only a section of it was more acutely inflamed than the other adjacent areas. Could we not have in some of these conditions a localized iritis, one that did not involve the entire iris? This might give some clue as to the selective tendency of these toxins and the relation to the question of infection.

Dr. Brown, in replying to Dr. Suker's question concerning the type of the iritis, said the first case was an ordinary acute iridocyclitis, with only one (deep) synechia. In the second case all parts were markedly inflamed, iris, ciliary body and choroid, and no part of the iris was exempt from the inflammation. The third case was a severe serous iridocyclitis with only slight involvement of the iris aside from the great difficulty experienced in securing dilatation of the pupil.

NEW OBSERVATIONS ON CORNEA AND RETINA OF THE EYE.

Dr. Robert Von Der Heydt gave a translation of a lecture delivered February 26, 1916, by Dr. O. Haab of Zurich, Switzerland on this subject, from which we take the following extracts:

By the method of focal illumination and the loupe I have been able to first describe and isolate a keratitis, which I called the "gittrige" (grill-like). Later the Riband like keratitis (Bændertruebung) especially in infantile glaucoma, which was recently so thoroughly described, clinically and anatomically, in a thesis by Staehli. Then I have found the pupillary reflex which I have called "cortical reflext" (Hirnrinden reflex) and now am able to describe to you a new form of keratitis, which I have called "alphabet or letter keratitis" (Buchstaben-keratitis).

While we have made few changes in the loupee used for investigating, there has been much improvement in the method of focal light. Especially since we have the Nerst lamp giving a very strong and white light. With it one does not alone see better but actually more than with the ordinary gas or electric light.

The Nerst lamp has been recently improved by Gullstrand in the form of a slit (spaltlampe) with which we can easily see the corneal nerve fibers, as well as study the direction of flow of the aqueous, as recently described by Berg (Stockholm), and which has been experimentally proven by my able assistant Turk, when he described the causation of the Ehrlich vertical flourescein line in the aqueous.

Lately I have also used the still more powerful electric Osram lamp, which is constructed according to the half Watt system. Its illuminating power is near that of actual sunlight, so that with it one can observe the reflection of the so-called magic Japanese mirror.

These small mirrors are made of bronze and on their reverse side show ornamentations such as animals, flowers, plants, or inscriptions. The front surface is absolutely mirrorlike but in a certain diagonal direction in good illumination you may with some difficulty see a faint reflexion of the figure on the back caused be very slight alteration in the mirrorlike surface and corresponding with the respective design.

Now, about the corneal disease I have designated Buchstaben keratitis. It is a rare affection. I have discovered seven cases in the past eighteen years. For its observation a very intense lateral illumination is necessary. One sees superficially small and larger zones composed of short, straight, sometimes crossing one another, raised, linear cloudings of the epithelium. In arrangement they resemble straight letters, such as A, W, V or X. The larger lines may for a certain length be followed by a parallel double border. Scattered among them may be small round infiltrated zones, or a line may be interrupted by a group of these dots.

There is mild ciliary irritation. In one to three weeks the process may terminate, but the characteristic part of this keratitis are sure to follow severe relapses. Reduction of intraocular tension may complicate and finally permanent clouding of the stroma and corneal surface may destroy the usefulness of the eye.

This severe type of eye disease is illustrated in this 25-year-old patient. She was discharged from our clinic, October 28, 1915, after a year's treatment. Previous to this she had been under the care of four oculists. When we first saw her the useful vision of the left eye had been lost by corneal clouding. Her right eye had been involved for nine months previous to her visit to our clinic, and it showed distinctly the characteristics of the Buchastaben keratitis. In a most discouraging manner and in spite of all treatment the condition continued to progress for six or seven months. In this otherwise healthy individual a roentgenogram showed a very light shadow in left lung and as the tuberculin reaction was positive, we commenced using tuberculin Beranek, 26 injections; without visible improvement.

Her right eye was rapidly approaching the condition of the first involved left eye and possessed only a fraction of visual acuity. We then commenced injecting old tuberculin (Koch), and a radical change took place at once, ciliary injection subsided rapidly, cornea became smooth and commenced to clear up. After one month vision was 5/60, 4 weeks more 1/3 to 1/2 and a year after her admission to our clinic same was 6/8. Now, after four months you see an absolutely quiescent eye, with a mild corneal clouding, vision 6/6.

The old tuberculin treatment was carried out for three months, 24 injections, slowly increasing, 7 mg. was maximum. Her first involved eye, which shows peculiarly radiating linear cloudings showed no change, vision 1/10. There is no doubt in my mind that her right eye was on the way to a total loss of all useful vision and this was avoided by the use of old tuberculin.

Part 2 of the lecture deals with new observations on the fundus.

Dr. Von Der Heydt, in connection with Professor Haab's lecture, exhibited and reported two cases which bore some relation to the change described in the lecture. One was a case of choroidal rupture wherein after six months a red spot was seen in the macula. The other case was one of old neuro-retinitis in which the same red spot was observed. He had noticed and studied these red spots in one case for six months intermittently, and in the other for about two years. Both had shown identical characteristics. At one time, both spots, most markedly the one in the lady, were surrounded by a definite halo. This was an edema of the retina, and was definitely outlined and like a horse's collar, in shape. Later on these edematous zones flattened out and disappeared; they are practically gone now, but the reddish pathologic center shows decidedly. Thus in these two cases radically different causes brought on similar foveo-macular changes as a manifestation of insult to the retina.

A METHOD OF OPERATION IN COMPLETE OBLITERATION OF THE ANTERIOR CHAMBER WITH REPORT OF A CASE OF CORNEAL STAPHYLOMA

Dr. C. G. Darling said that during the past summer he performed an iridectomy in a case of corneal

staphyloma by making a very minute opening into the anterior chamber well back in the corneal limbus with a keratome, using sawing movements. This was enlarged as soon as he entered the anterior chamber with probe-pointed scissors; a spatula was passed between the iris and cornea to free the iris before introducing the iris forceps. In this case he obtained an almost immediate as well as a permanent flating of the staphyloma and normal tension. Later, when looking up the literature of this subject, he found this operation was similar to Gayet's method.

A short time ago a man entered his service at the County Hospital with a serpent ulcer of ten days' standing. Only a two or three millimeter margin of the cornea was left after perforation and healing.

A large staphyloma of the cornea was forming under the continuous use of a pressure bandage; the tension would rise, a fistula would form, this would close and tension go up again with increase in size of staphyloma, then the process would go through the same cycle again. The lens was still present in the eye.

Here the iris was very much stretched, thin and adherent to the corneal rim, only 2 or 3 millimeters from the limbus, so he did not feel he had enough room in which to do any of the operations of which he had spoken, or that any of them would open the iris angle as the iris was probably adherent at the angle, and would remain so after ordinary iridectomy as the iris would tear before freeing the angle.

An iridectomy was done in this case in the following manner: Hein's cyclodralysis operation was done opposite the widest area of sound corneal rim. The spatula when in the anterior chamber, separated the iris from the cornea; it was passed forward until the iris was somewhat torn from the corneal rim, the spatula being well curved so that it hugged the back of the cornea. With the point of a keratome using sawing movements the spatula was cut down upon well back in the limbus so that the cornea would be left untouched and the iridectomy would be well to the root of the iris to give good drainage. This incision was enlarged with scissors, but he believed a canaliculous knife, if very sharp, would have been better as he does not think it would cause as much trauma. The iris forceps were now introduced, the spatula removed, and an iridectomy of about 3 millimeters wide was made at the first attempt. Wishing to make the iridectomy wider he had to reintroduce the spatula to get the iris forceps between the iris and cornea. This was done on one side and then the other of the primary attempt, giving an iridectomy of over 10 millimeters wide well back at the root of the iris. This operation has caused some flating of the cornea, decrease in tension, and a little vision, which is now hand movements. The cornea in this case was so extremely thin that any tension above a negative one would cause some bulging, so another iridectomy was attempted on the opposite side of the cornea four days ago. On this side the iris had been more stretched and was very thin and atrophic, so that a piece of it would tear out whenever taken hold of. Here he passed the spatula forward and cut the iris from the cornea rim for about one-third of its circumference, and as the iris is, of course, freed from the cornea at its root, at the same time, this freeing of the iris should act fully as well as iridectomy in establishing an anterior chamber and drainage. He saw the case today and the corneal curvature is perfectly regular.

Dr. Darling, in closing, thought the method he had described was of some advantage in saving eyes, especially in children with large perforating corneal ulcer, as the eye would aid in the growth of that side of the orbit. In a good many cases of ulcer of the cornea from gonorrheal opthalmia and other diseases in children, the eyeball had to be removed and the orbit on that side did not grow. If this operation could be done, freeing the iris from the cornea, or an iridectomy done, the eyeball would be preserved, with possibly a little vision, and the orbit would grow on that side.

SARCOMA OF THE CHOROID

Dr. Lawrence J. Hughes, Elgin, Ill., spoke of having presented a case two months ago which was diagnosed as sarcoma of the choroid. The case was discussed by Dr. Fisher at the time who thought it was a typical case of this disease. Shortly after that the speaker removed the eye, and so far as cicroscopic examination of a section of the eye was concerned, there was no evidence of sarcoma.

(To be Continued.)

MACOUPIN COUNTY MEDICAL SOCIETY

The Macoupin County Medical Society met Tuesday, March 27, 1917, in the New Commercial Hall at Virden and was called to order by President F. A. Renner, of Benld.

The minutes of the last regular meeting were read and approved. Twenty-four members and visitors were present.

By the direction of the president the secretary had been publishing articles on tuberculosis in all of the newspapers of the county, fifteen in number, with the idea in mind of so educating the voters that at the next general election the proposition for a sanatorium might be carried.

The Society on motion unanimously endorsed this work and authorized the secretary to continue the publication of the articles in the press of the county.

The secretary reported having taken up the work officially for the Society of communicating with the members of the General Assembly of the local district regarding proposed medical legislation, which report was accepted unanimously and he was instructed to continue the same work.

Moved and seconded that as a token of our appreciation of the efficient work done by our secretary that he be given a button of the A. M. A., which motion carried unanimously.

The censors reported Girard as the meeting place for May and nominated the following officers for the coming year, who were elected unanimously: Presi-

dent, Dr. G. E. Hill, Girard; vice-president, Dr. W. L. Powell, Palmyra; secretary-treasurer, Dr. T. D. Doan, Scottville; medico-legal advisor, Dr. J. S. Collins, Carlinville; delegate, Dr. T. D. Doan, Scottville; alternate delegate, Dr. J. P. Matthews, Carlinville.

Dr. F. M. Wood, of Chicago, gave an address on the subject "The Vaccine Treatment of Rheumatism."

Dr. H. C. Blankmeyer, of Springfield, gave an address on the subject, "The Newer Simplified Methods of Feeding Normal Infants."

A rising vote was given the two physicians for their excellent addresses.

The meeting then adjourned to meet at Girard, Tuesday, May 28, 1917.

T. D. DOAN, *Secretary.*

MADISON COUNTY

The Madison County Medical Society met in the rooms of the Commercial Club in Collinsville on the afternoon of Friday, March 2, 1917, with President Dr. J. B. Hastings in the chair.

Twenty members present; three visitors.

The subject of compulsory health insurance was presented and discussed. Dr. Gossard moved that the chair appoint a committee of 15 members to go to the legislature at Springfield, at the call of the State Legislative Committee, to assist said committee in every way within its power and that the question of defraying the expenses of the committee be taken up and adjusted at some future meeting. Carried. Dr. Luster moved that the secretary be instructed to notify the Legislative Committee of above action. On motion it was ordered that Dr. Hastings be a member of above committee.

Attention was called to the Osteopathic Bill now in the Judiciary Committee of the House. Dr. Braner moved that the secretary be instructed to communicate with our representatives in the legislature expressing the sentiment of this society as thoroughly opposed to this bill. Carried.

Dr. J. L. Wiggins then presented a paper on "Morbidity Incident to Obscure Umbilical Hernia," and also presented a patient to illustrate the subject. He called attention to the fact that a very small hernia, possibly containing nothing but a small bit of omentum, was often overlooked, and yet could be the cause of many distressing symptoms and cause a condition that would disable a man from performing manual labor. He cited 28 cases in which he inverted the skin surrounding the umbilicus to act as an obturator and fastening it firmly by an adhesive strap. He reports great success with this method of treatment. The paper was very instructive and called out extensive discussion.

Dr. Barnsback moved that a vote of thanks be extended to Dr. Wiggins, which was adopted by a rising vote.

On motion adjourned to meet in Alton on the first Friday in April.

MONTGOMERY COUNTY

The annual medical clinic of the Society was held at the Hillsboro Hospital Tuesday afternoon, March 27, and was conducted by Dr. Albert E. Taussig, Professor of Medicine, Washington University, St. Louis.

Twenty-two present.

Among the patients were a case of acute Graves' disease, a submaxillary cyst, pulmonary edema, appendicitis, tuberculous meningitis, a valvular heart lesion. The clinic was an unusually interesting one. The Society was fortunate to secure Dr. Taussig for this occasion, and all who heard him would be glad to have him with us again at some future time.

Dr. M. W. Snell was unanimously chosen as delegate to the State Society to take the place of Dr. R. W. Allen, who is not expected to be in the county at the time of the State meeting.

OGLE COUNTY

The regular quarerly meeting of the Ogle County Medical Society was held at the Court House, Oregon, April 17, 1917, at 1:30 p. m.

President A. H. Beebe called the meeting to order. Roll call found nine members present and seven visitors.

Dr. John B. Roe, Oregon, was elected to membership.

A communication was read from University of Illinois College of Medicine. The society passed a resolution favoring the resolution and asking for further information.

Dr. Charles J. Drueck, Chicago, read an excellent paper on "The Treatment of Hemorrhoids Under Local Anesthesia." This paper was ably discussed by Drs. Stealy, Murphy and Turner, Dr. Drueck closing the discussion.

Dr. Chas. C. Kost, of Dixon, read an able paper on Colles' fracture. Discussion followed by Drs. Beveridge, Beebe, Johnson, Murphy, Turner and Price, Dr. Kost closing.

The doctor gave particular stress on letting the arm hang down in all cases of Colles' fractures.

On motion of Dr. Beveridge, a rising vote of thanks was given Drs. Drueck and Kost for their excellent papers.

Adjourned to meet at Byron the third Wednesday in July, 1917.

DR. J. T. KRETSINGER, *Secy.*

WINNEBAGO COUNTY

The Winnebago County Medical Society met at Unity Hall, Rockford, on April 10. There were 21 members present. Reading of the minutes was suspended and the following program was rendered:

Dr. W. W. Hume reported a case of fistula of the horizontal semicircular canal.

Dr. Adolph Hartung of Chicago was introduced as the speaker of the evening. He spoke on the subject, "The Roentgen Diagnosis of Gastro-Intestinal Lesions," and showed numerous stereopticon slides to illustrate his talk. These slides truly proved that the x-ray is of much value in gastro-intestinal diagnosis.

Following the reading of a letter from Frederick R.

Green, secretary, Council on Health and Public Instruction of the American Medical Association, in regard to the second annual baby week campaign throughout the country on May 1 to 6, the chair saw fit to appoint a committee of three to cooperate with the Children's Bureau and the Woman's Club to make Baby Week in this territory a success. Drs. Boswell, Farrell and Gerald Allaben were appointed.

The following resolutions were read by Dr. Lichty:

WHEREAS, The physicians and sanitarians recognize that insanitary and crowded housing does more to continue sickness and cause death, as well as lower moral standards, than all other avoidable causes; therefore, be it

Resolved, By the Winnebgo County Medical Society that the Rockford Realty Association be asked to refuse to list property for rent that has been inspected and disapproved by either or both the Housing Committees of the Winnebago County Medical Society and the Winnebago County Anti-Tuberculosis Association until such premises are put in sanitary condition. Also that the Chamber of Commerce list insanitary tenements and homes and jointly warn tenants and landlords.

It was decided that these resolutions be adopted and a copy presented to the Rockford Realty Association.

A letter from Dr. Edmund James, president of Illinois University, in regard to post-graduate work for practitioners, was read. Following discussion it was decided that the officers of the society form a committee to make further inquiry about this work.

Dr. Hartung was given a rising vote of thanks by the society for his talk.

C. M. RANSEEN, M. D., *Secy.*

Personals

Dr. E. J. Hoag, of Ridott, sustained a fracture from cranking his automobile.

Dr. George L. Eyster, of Rock Island, has returned from a three months' vacation trip through California and British Columbia.

Dr. Leon W. Kelso, Paxton, has been appointed local surgeon for the Illinois Central Railroad, succeeding Dr. Spencer S. Fuller resigned.

Dr. C. T. Foster, city physician of Rock Island, seriously infected after performing a surgical operation, is traveling in the west for his health.

Dr. A. H. Roler, after investigating the treatment of war prisoners by the German as a representative of the Allies, reports that they were better off than the poor in the large cities.

Dr. John W. Earel, Quincy, who is expected to resume practice after an absence of nearly a year on account of illness, has had a relapse and may not be able to return to work for two or three months.

Dr. C. P. Caldwell was re-elected president of the board of directors of the municipal tuberculosis sanitarium of Chicago, and F. Bowden DeForest, was elected secretary at the annual meeting.

May 6 to 13 Dr. Otto T. Freer is to give a source of lectures, illustrative operations and demonstrations in Portland, Oregon, by invitation of the Portland Ophthalmological, Otological and Laryngological Society.

News Notes

—Medical students in Illinois colleges are assured of graduation if absent from college on service in army or navy hospitals.

—Students of the College of Medicine, University of Illinois, are having military drills twice weekly as part of the curriculum.

—The demand both for physicians and nurses on account of war activities is becoming urgent. Already nurses are at a premium in public institutions.

—Bonds from $750,000 were voted in the spring election for an addition to the contagious disease hospital in Chicago. Two new wings will be built.

—Dr. Harry M. Weinberg, Chicago, recently arrested by federal officers for the illegal sale of morphine, is said to have been in charge of the "clinical work" of the Anti-Cigarette League.

—Prof. Morris Jastrow, Philadelphia, gave an illustrated lecture on "The Medicine of the Babylonians and Assyrians" before the Society of Medical History of Chicago, April 27.

—Dr. Charles P. Emerson, Indianapolis, dean of the Indiana University School of Medicine, delivered an address, April 13, on "Modern Medicine and the School Child," before the Illinois State Teachers' Association.

—A contract for the erection of the first unit of the Illinois Valley Hospital, Ottawa, has been awarded. The new building will cost about $30,000 and will be known as the Diagnostic Pavilion. It will be one story in height and of masonry construction with high basement.

—At the quarterly meeting of the Warren County Medical Society, held in Monmouth,

April 15, Dr. Kellogg Speed, Chicago, delivered an address on "Military Surgery," illustrated by stereopticon views, and Dr. Wilber E. Post, Chicago, spoke on "The Use of Salts and Alkali in Nephritis.

—The directors of the Municipal Tuberculosis Sanitarium have undertaken a survey of the Chicago South Side where many Negroes from the South have settled in the past few months. The survey of the "Little Italy" district on the North Side disclosed several hundred cases within a few blocks.

—The directors of the Fenger Memorial Association have made a grant of $400 to Pierce McKenzie for support of chemical and other work under the direction of Dr. E. R. LeCount. He will study the brain and other tissues from cases of heat stroke in order to determine, if possible, better than now known the cause of the high temperature in this condition.

—Messrs. V. Mueller and George Wallerich, president and secretary of the V. Mueller Surgical Instrument Company, have donated $10,000 to the North Chicago Hospital independent unit for war hospital service. The Medical Women's Club, of Chicago, have pledged their services to the state in the name of a "United States Women's Military Reserve Corps."

—Aldermen Capitain, Nance, Littler and Richert, a sub-committee of the Chicago Council, after a year's study of the charges against Dr. Sachs' management of the municipal tuberculosis sanitarium, reported: "There has not been presented, in the opinion of your sub-committee, one scintilla of evidence that in the slightest degree impeaches the integrity or that questions the efficiency or the competency of Dr. Theodore B. Sachs. On the contrary, every witness of standing examined, including Dr. Robertson himself, spoke in the highest terms of the service which he had rendered to humanity. The usual statement was that he was in a class by himself. His personal sacrifice and untiring devotion to the work which he had undertaken received universal praise."

Marriages

Robert Sonnenschein, M. D., to Miss Flora Kieferstein, both of Chicago, April 5.

Herman Morris Adler, M. D., Chicago to Miss Frances Porter of Hubbard Woods, Ill., recently.

Sophia Billenkamp, M. D., to Mr. John Conrad Donis, both of St. Louis, at Clayton, Ill., April 4.

Deaths

Abbie A. Hinkle, M. D., Evanston, Ill.; Hahnemann Medical College, Chicago, 1887; died at her home, April 2.

Harvey A. White, M. D., Chicago; Eclectic Medical Institute, Cincinnati, 1882; aged 78; died in Tampa, Fla., March 27.

Henry W. Ogden, M. D., Evanston, Ill.; Rush Medical College, 1881; aged 73; for many years a practitioner at Fort Atkinson, Wis.; a veteran of the Civil War; died at his home, February 17.

Arthur von Werder, Chicago (license, Illinois, 1889, on certificate from War Department, Russia, 1883); aged 75; a practitioner since 1859; died at his home, March 23, from cerebral hemorrhage.

Maximilian C. Cornelius, M. D., Chicago; John A. Creighton Medical College, Omaha, Neb., 1895; aged 43; died in St. Luke's Hospital, Chicago, April 3, after an operation for carcinoma of the bladder.

John Dean Scouller, M. D., Pontiac, Ill.; University of Buffalo, N. Y., 1870; aged 81; for nineteen years superintendent of the State Reformatory, Pontiac; died in that city, March 31, after a surgical operation.

John J. Stites, M. D., Pontiac, Ill.; Eclectic Medical Institute, Cincinnati, 1850; Medical School of the Valley of Virginia, Winchester, 1860; aged 90; formerly a member of the Illinois State Medical Society; died at his home, March 25.

William Washington Everett, M. D., Highland, Ill.; College of Physicians and Surgeons, Keokuk, Ia., 1877; aged 60; formerly a Fellow of the American Medical Association; a member of the Illinois State Medical Society; surgeon to St. Joseph's Hospital, Highland; died in a hospital in St. Louis, March 30, from a nervous breakdown.

George Fuller Hawley, M. D., Chicago; College of Physicians and Surgeons in the City of New York, 1868; aged 73; formerly a Fellow of the American Medical Association; a member of the Illinois State Medical Society, Mississippi Valley Medical Association and American Academy of Ophthalmology and Oto-Laryngology; professor of otology, rhinology and laryngology in the Illinois Post-Graduate Medical School; a member of the staff of Cook County Hospital, and the Illinois Charitable Eye and Ear Infirmary; one of the first men in Chicago to specialize on diseases of the eye, ear, nose and throat; an assistant of Sir Morrell Mackenzie in the early eighties; died at his home, April 16, from chronic myocarditis.